



Nagpur Metro Rail Corporation Limited

Date: 25.11.2016

Name of Work: Design, Manufacture, Supply, Installation, Testing and Commissioning of Telecommunication System.

Tender No. NITL-01/2016

Tender No. (As uploaded in the E-Tender Portal of NMRCL): **No.58**

Corrigendum-VI

Reply of Prebid Query

Part A-Pre-bid Minutes

Part B-Addendum/Corrigendum

Part C-Annexure (I-IV)

Part D- Drawings

GM/Procurement

Nagpur Metro Rail Corp. Ltd.

MINUTES OF PRI BID MEETING HELD ON 15.9.16 FOR DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF TELECOMMUNICATION SYSTEM

SN	Clause No	Brief Clause Description	Applicant's Query / Suggestion	Response of NMRCL
General Query				
1		General	Please clarify the locations of stations, OCC, BCC, Depots and kindly provide their respective layout plans.	Drawings, wherever available are included under Part II, Section VII C, Kindly refer to Corrigendum/Addendum, Item No 51 for details
2		General	Kindly provide architectural drawings of Stations, Depot buildings & RSS and Depot GAD. Please share all Stations, OCC, BCC, RSS and depot or any other drawings in Autocad format. It will be helpful to have section drawings with dimensions and with all floors	
3		General	Please clarify the exact location of BCC. In many clauses NMRCL HQ is mentioned. Hence, kindly clarify if it should be considered as the location for BCC.	Initially OCC will be located in NMRCL HQ at Metro Bhavan, near Diksha Bhoomi, after construction of OCC building at Sitabuildi, It will become BCC.
4		General	Please advise the geographical location of OCC/BCC/HQ.	
5		General	We understand the NS01 contract listed in many locations refer to Telecom contract N1TL01. Kindly confirm.	Scope of NS01 contractor is to provide UPS, Video wall & interface with telecome system. Remaining items will be under scope of N1TL01
6		General	Kindly advise the load to be considered for AFC on location basis for UPS sizing calculations.	Provision of UPS is in the scope of Ns01 Contractor
7		In pre bid meeting it was informed that Price schedule to be made manually, scanned and uploaded.	Please confirm	Bidders understanding is correct
8	NIL	Service Level Agreement (SLA)	Penalties in case of non-availability or in the event of system getting down or breach of availability is not properly defined. Request to clarify.	Query is not relating to any specific clause. No change in Tender specification
Part I Format for Invitation of bids				
9		Tender Notice	Considering the complexity of the tender requirements, request you to extend the Date & time of Submission of Tender online by 8 weeks.	Bid opening date extended to 10.11.16.
10	Nil		We request you to please give atleast 3 weeks extension for submitting the bid.	
11	3)	3. Bids must be submitted in the above portal on or before 16:00 Hrs noon on 10.09.2016 and must be accompanied by a security of INR 9.6 Million as per ITB & BDS 4. Bids will be opened in the presence of bidders' representatives who choose to anend on 10.09.2016 at 16:30 Hrs in the office of GM / Procurement at "Metro House", 28/2 CK Naidu Marg, Anand Nagar, Civil Lines, NAGPUR, MAHARASHTRA-440001 (INDIA) Ph. 0712-2554217.	The bid submission & opening date as per E-TENDER NOTICE - NAGPUR METRO RAIL CORPORATION LTD is as below: Date & Time of submission of Tender: Online submission up to 16.00 Hrs on 10.10.2016 at NMRCL's e-tender notice. Date & Time of Opening of Tender: On 10.10.2016 at 16.30 Hours or as decided by the authority at Metro House, 28/2, Anand Nagar, Civil lines, Nagpur440001 as per Part-I. Section III, IFB Kindly clarify which is the correct date.	Kindly refer to Invitation of Bid Cl. 3 & 4, which is self explanatory
Part I Section I (ITB)				
12	4.2	A Bidder shall not have a conflict of interest. Any Bidder found to have a conflict of interest shall be disqualified	We understand with this clause that Bidders who are within consortium does not fall under conflict of interest. Please clarify	Clause is Self explanatory
13	14.7	Unless otherwise specified in the BDS, all duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 28 days prior to the deadline for submission of bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.	What about if Taxes changes after BID submission or PO released	Kindly refer Part 3 section IX PC Clause 51 (Sub-clause 13.7 – Adjustments for Changes in Legislation) , which is self explanatory
15	21.1	The Bidder shall enclose the original and one set of all copies of the bid, including alternative bids, if permitted in accordance with ITB 13, in separate sealed envelopes, duly marking the envelopes as "ORIGINAL", "ALTERNATIVE" and "COPY." These envelopes containing the original and the copies shall then be enclosed in one single envelope	Since it is an online bidding, is it required to submit the bid twice one in original and other one in copy. Please Clarify	Kindly refer to BDS ITB 21.1, wherein above clause is deleted
16	40.2	Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.	Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.	Bidder request declined. Provision of tender clause will prevail.

PART A Pre Bid Minutes

17	42.1	Within twenty-eight (28) days of the receipt of notification of award from the Employer, the successful Bidder shall furnish the performance security in accordance with the General Conditions of Contract, subject to ITB 35.5, using for that purpose the Performance Security Form included in Section X Contract Forms, or another form acceptable to the Employer. If the performance security furnished by the successful Bidder is in the form of a bond, it shall be issued by a bonding or insurance company that has been determined by the successful Bidder to be acceptable to the Employer. A foreign institution providing a bond shall have a correspondent financial institution located in the Employer's Country.	Requests modification: - Within twenty-eight (28) days of the execution of the contract receipt of notification of award from the Employer, the successful Bidder shall furnish the performance security in accordance with the General Conditions of Contract, subject to ITB 35.5, using for that purpose the Performance Security Form included in Section X Contract Forms, or another form acceptable to the Employer. If the performance security furnished by the successful Bidder is in the form of a bond, it shall be issued by a bonding or insurance company that has been determined by the successful Bidder to be acceptable to the Employer. A foreign institution providing a bond shall have a correspondent financial institution located in the Employer's Country.	Bidder request declined. Provision of tender clause will prevail.
Part I		Section II(BDS)		
18	1.3	The work comprises design, manufacture, supply, installation, testing and commissioning of Telecommunication System, comprehensive maintenance of electronic components and the training of operation & maintenance personnel. It also includes the supply of spares, training, operation & maintenance manuals.	Please elaborate about the "comprehensive maintenance of electronic components" and Please confirm about the duration of the "comprehensive maintenance of electronic components".	It is clarified that Comprehensive maintenance is not in the scope of this Contract.
19	1.4	The Telecommunication System including configuration required to be supplied are indicated in the Part III, Section VIII- at the end of General Conditions "Contract Data"	-	Kindly refer to Corrigendum/Addendum , Item No 1
20	1.6	To facilitate ease in maintenance and easy availability of spares, NMRCL is keen on standardization and expects the Contractor to make efforts to source maximum number of equipment and materials from India.	Does this domestic preference for equipment and materials have any weightage during the evaluation? If yes, kindly advise.	Domestic preference is not applicable. Kindly refer to Part I, Section III (3)
21	1.8	The Contractor shall also carry out effective interface and coordination with the relevant Authorities and Designated Contractors and others appointed by the Employer from time to time, during the Contract Period.	Kindly request the Employer to provide a indicative list of all the interfaces required (preferably a matrix of interfaces with other contractors/ agencies etc.S) for our understanding and preparing the Coordination Control team as per ITB 11.3.1.13	Interface table included, Kindly refer to Corrigendum/Addendum , Item No 64
22	4.8	Further, a Power of Attorney signed by all the Consortium Members duly supported by their board resolutions must also accompany the Bid authorizing the Lead Member, inter alia, to submit the Bid on their behalf. The formats of the Power of Attorney as well as the board resolution are provided in Section IV: Bidding Form (Form 9). As the Contract Agreement will be required to be executed by all other Members of the Consortium also in addition to signing by the Lead Member, therefore each of such other Members is required to issue a Power of Attorney authorizing an individual as its authorized signatory, inter alia, to sign the Contract Agreement. The format of the Power of Attorney is provided in Section IV: Bidding Form (Form 9D)	It is difficult to obtain board resolution for a specific tender. Request you to please allow us to use standard board resolution in favour of our representative which is generally submitted in tenders like this along with a project specific POA as per your format issued by our representative to the authorized person submitting the specific bid.	Power of Attorney given to the authorized signatories by the Managing Director who is empowered to sub delegate the power under board resolution, will also be valid and hold good for the signing and execution of the Bid document. Kindly refer to Corrigendum/Addendum , Item No 2

PART A Pre Bid Minutes

23	4.10	The mode of execution of the power of attorney should be in accordance with the procedure, if any laid down by the applicable law and the charter documents of the executant(s) and when it is so required the same should be under common seal affixed in accordance with the required procedure. For a Power of Attorney executed and issued overseas, the document will also have to be legalized by the Indian Embassy and/or notarized in the jurisdiction where the Power of Attorney is being issued. However, the Power of Attorney provided by a Bidder from a country which has signed the Hague Legislation Convention 1961 is not required to be legalized by the Indian Embassy if it carries a conforming Apostille certificate.	In case if a Chinese Company is a Listed company in International stock exchange , then all its financial & borad of directors are readily available & authentic. There fore we request NMRC to relax the condition of the Attestation through Indian Embassy for Power of Attorney as it need min 60 days to get it done in Indian Embassy in CHINA	Bidder request declined. Provision of tender clause will prevail.
24	4.11	Where the Bidder is a Consortium or Joint Venture, the Bidder shall submit the following additional information to meet the qualification criteria for eligibility: (a) A Memorandum of Understanding / Consortium Agreement shall be provided duly notarized by the notary public of country of origin and should be stamped by Embassy / High Commission. Bidders from Member Countries of Hague convention may submit all these documents with “Apostille” stamp instead of Embassy. (b) nomination of one of the Members of the Consortium or Joint Venture to be in-charge (“Lead member”); and this authorization shall be covered in the Power of Attorney signed by the legally authorized signatories of all Members of Consortium or Joint Venture. (c) details of the intended financial participation by each member shall be furnished with complete details of the proposed division of responsibilities and relationships among the individual Members.	In case if a Chinese Company is a Listed company in International stock exchange , then all its financial & borad of directors are readily available & authentic. In case where the consortium is signed between the Parent company located in CHINA & with its 100% indian Subsidiary located in INDIA , can the MOU / Agreements can be duly authorised in INDIAN Court. While maintaining and ensuring the requirement of joint and several liabilities amongst the parties, we request NMRC to confirm that each party of the consortium shall be able to invoice NMRCL through consortium leader for their respective scopes of work and shall accordingly be paid directly for their respective account. This would be the most efficient method of payment based on scope of work as brought out in the price schedule and MoU for each legal entity. The same practice is prevalent in DMRC Signalling and Telecom tenders.	Bidder request declined. Provision of tender clause will prevail.
25	11.1.2	In ITB 11.1.2 It is mentioned that The Bidder shall, on or before the date given in NIT, submit his Bid clearly marked with the name of the Bidder and with: Contract N1TL01/2016: Bid Security; Contract N1TL01/2016: Initial Filter Documents & Technical Package; and Contract N1TL01/2016: Financial Package. While in ITB 21.4 it is mentioned that Bids shall be submitted through e-tender portal of NMRCL only with clearly marked ‘Technical Proposal’, containing documents comprising the Technical Proposal in accordance with the provisions of ITB 16, and the other clearly marked ‘Financial Proposal’, containing Schedule of Prices or the Pricing Documents in accordance with the provisions of ITB 14.	Please clarify which one needs to consider among ITB 11.1.2 & ITB 21.4 .	ITB 21.4 to be followed. Kindly refer to Corrigendum/Addendum, Item No 3
26	11.3.1.8	Bidder’s Technical Proposal: The Bidder shall submit with its Bid its Technical Proposals as described in Section IV: Bidding Form (Form 4.4; Part IC).		Kindly refer to Corrigendum/Addendum, Item No 4
27	11.3.1.15(1)	Periods for each stage of work are given in Part III, Section IX, PC Part A – Contract Data.		Kindly refer to Corrigendum/Addendum, Item No 5
28	11.3.1.19	Declaration for non-engagement of any agent, middlemen or intermediary (as per format provided in Section IV: Bidding Forms (Form 17);		Kindly refer to Corrigendum/Addendum, Item No 6
29	11.3.1.24 (1)	The price of unqualified and unconditional withdrawal of all the conditions, qualifications, deviations etc. shall be quoted by the Bidder in the format given in Pricing Document (Section IV: Bidding Forms (Form 3; Part 1B))		Kindly refer to Corrigendum/Addendum, Item No 7
30	11.3.1.25	(c) Documents amplifying the Bidder’s Technical proposal as described in Section IV: Bidding Forms (Form 4.4; Part 1C)		Kindly refer to Corrigendum/Addendum, Item No 8

PART A Pre Bid Minutes

31	11.3.1.26	The Bidder's attention is drawn to the requirement that access to the Site or parts of the Site will, from time to time, have to be shared with other contractors carrying out works on,.....	Please confirm if the payments made to any relevant government authorities as statutory charges including restoration if levied by the concerned authorities to grant ROW permission shall be reimbursed extra at actual	Provision of BDS clause, GCC clause 2.1 & PC clause 3 are self explanatory.
32	11.4.1	The Bidder shall submit the following documents duly completed with the Financial Package of its Bid Submission. B. Bid as elaborated in Pricing Document (Section IV: Bidding Forms (Form 3; Part 1B), excluding any discounts offered;	-	Kindly refer to Corrigendum/Addendum, Item No 9
33	11.4.2	Bidders shall quote its price as elaborated in Pricing Document (Section IV: Bidding Forms (Form 3; Part 1B)	-	Kindly refer to Corrigendum/Addendum, Item No10
34	14.2	Replace provisions of ITB 14.2 with the following: The Pricing Document is included in Section IV (Bidding Forms (Form 3; Part 1B)). Periods for each stage of Work are given in Section IX. Particular Conditions, Part A – Contract Data 'Table – Summary of Sections'.	-	Kindly refer to Corrigendum/Addendum, Item No 11
35	14.5	For price adjustment / variation, refer to instructions / conditions contained in the Pricing Document (Section IV: Bidding Forms (Form 3; Part 1B)	-	Kindly refer to Corrigendum/Addendum, Item No 12
36	14.7	Bidder shall quote its fixed lump sum price inclusive of all taxes, levies, duties, cess, royalty, rates and other charges leviable and payable to the authorities as elaborated in Section IV Bidding Forms (Form 3; Part 1B – Pricing Document). The Bidder shall also give breakdown of its fixed lump sum price clearly giving the Customs Duty, Excise Duty, Value Added Tax (VAT), Works Contract Tax (WCT), Octroi/Entry Tax and other levies/Cess etc.; as elaborated in Section IV Bidding Forms (Form 3; Part 1B – Pricing Document).	-	Kindly refer to Corrigendum/Addendum, Item No 13
37	14.15	As per Notification No. 25/2012 – Service Tax Act (dated 20.6.2012) under section 93(1) read with section 66(B) of the Finance Act, by way of erection, construction, commissioning or installation of original works pertaining to railways including monorail or metro are exempted from the whole of service tax leviable thereon. The said notification is applicable for main contractors and even for subcontractors. The Bidders shall examine his own assessment in regard to service tax liability in the contract. No separate tax reimbursement will be made by NMRCL.	We understand that Service tax exemption for metro is withdrawn by the govt under notification no. 09/2016- ST dated 1st March, 2016 . Such being the case can we presume that Nagpur Metro can also avail CENVAT credit for the Service Tax paid by the Contractor like for any other end user organization. Kindly clarify 1)This exemption under notification No 25/2012 is already withdrawn. Request For the clarity whether Service Tax can be reimbursed by NMRCL 2) In the event that service tax exemption is not available NMRCL will reimburse Service Tax. As per Union Budget 2016 Service Tax is applicable @15% on all services provided to Metro , hence need clarification from NMRCL	(1)For information of Bidders, the Department of Revenue vide notification No. 334/8/2016-TRU dated 29.02.2016 has withdrawn exemption of Service Tax related to construction, erection, commissioning / installation of original works of Metro projects in respect of contracts entered into on or after 01.03.2016. (2) Provision of clause are self explanatory. The Bidders shall do his own assessment in regard applicability of service tax liability in the contract.
38	14.16	NMRCL project is covered under Project Import chapter 98.01 of Custom Tariff Act according to which only concessional custom duty is payable. The Bidder should avail this benefit and pass on the benefit of the same to NMRCL. PC 53 (sub clause 14.1) (c): The Contractor shall be solely responsible to find out and ascertain whether their supplies for Nagpur Metro Rail Project will qualify and be eligible for the concession duty benefits under Chapter 98.01 of custom Tariff Act for project Imports& shall manage the Custom Duty and Excise duty applicability and inclusion in their quoted price accordingly.	PC 53 and ITB 14.16 contradicting each other. As per PC 53 contractor is responsible to find out about applicability of Chapter 98.01 whereas, in ITB states that the NMRCL is covered under chapter 98.01. Kindly confirm. Kindly also confirm that this project is covered under chapter 98.01 and N1S01 contractor can avail concessional custom duty benefit. Pl list out all Project Benefit applicable to Metro project	Refer to Chapter no. 98.01 of Customs Tariff Act 1975 Bidders are required to arrange themselves as it is available in public domain.
39	14.17	The Contractor shall maintain details of MVAT paid to 'Trade and Taxes' department and submit:	Shall customer need VAT Invoice only or we can do E-1 for Local & HSS for import part	Only VAT invoice will be accepted. Please refer to Section IX, Para 53, Point e.

PART A Pre Bid Minutes

40	14.18	In view of above, the Bidders are advised to quote the price inclusive of all central/state/local taxes, duties, levies, cess and all other incidental charges required to fulfill the bidding conditions including statutory deduction viz., TDS towards Income Tax / Works Contract Tax etc. after considering ITB 14.7 to 14.18 above.	What about when GST come in to existence after 1st Apl 17, Shall Metro provide C Form against CST Sale.	Kidly refer to PC Clause 51 (Adjustments for Changes in Legislation) , which is self explanatory. NMRCL will not provide Form C
41	15.1 (ii)	[...] For those inputs to the Works that the Bidder expects to supply from outside the Employer’s country (referred to as “the foreign currency requirements”), in Japanese Yen, Euros or US Dollars	Please clarify that the Bidder could quote in a mix of these three mentioned currencies or whether the Bidder has to quote in one of these three currencies?	Bidder can quote in any one of these three currencies or combination of currencies
42	15.1	The currency(ies) of the bid and the payment currency(ies) shall be in accordance with AlternativeB as described below: Alternative B (Bidders allowed to quote in local and foreign currencies): (a) The unit rates and prices shall be quoted by the Bidder in the Schedules separately in the following currencies: (i) for those inputs to the Works that the Bidder expects to supply from within the Employer’s country, in Indian Rupees(the name of the currency of the Employer’s country),and further referred to as “the local currency”; and (ii) for those inputs to the Works that the Bidder expects to supply from outside the Employer’s country (referred to as “the foreign currency requirements”), in Japanese Yen, Euros (€) or US Dollars (US\$).	Bidder would like to know whether NMRCL can enter into High sea sale Agreement in USD for the imported Material	Bidder request declined. Provision of tender clause will prevail.
43	19.1	A Bid Security is required Rs 96 Lakhs (9.6 Million INR) in form of unconditioned guarantee issued by any Nationalized or Scheduled Commercial Bank (including scheduled commercial foreign bank) in India.In the form of Bid Security	In case where a Parent company (Foreign Company) is partnering in consortium with its 100% subsidiary based in INDIA (ZTE Corporation will be a lead bidder in consortium with ZTE Telecom India Pvt Ltd) , can the Bid security can be provided only with the name as applicant of the Parent company i.e ZTE Corporation . Who is also a Lead Bidder in the consortium	Bidder request declined. Provision of tender clause will prevail.
44	20.2	The original and all copies of the bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the bid where entries or amendments have been made shall be signed or initialed by the person signing the bid.	We understand that all the Bid documents will be signed and initialed by authorized signatory of Lead Member of Consortium only unless & until there is a special requirement for any document to be signed by to be signed by all consortium members.	The various forms provided along the bid documents indicate clearly the signatory of the said document however the authorized POA should also sign the same and submit.
45	29.2.1.	Evaluation of qualifying conditions: Bids that include qualifications which: 1. seek to shift to the Employer, another government agency or another contractor all or part of the risk and/or liability allocated to the Contractor in the Bidding Documents; or 2. which includes a deviation from the Bidding Documents which would render the Works, or any part thereof, unfit for their intended purpose; or 3. fails to fulfill the eligibility criteria as mentioned in SN 12, 12.1 and 13 of “(A) FILTER OF APPLICANTS – CHECKLIST of INITITAL FILTER EVALUATION CRITERIA”; or 4. which fails to commit to the date specified for the completion of the Works as specified under Key Dates 6 and 9 under Section IX. Particular Conditions (PC) Part A – Contract Data ‘Table: Summary of Sections’ will be deemed non-conforming and shall be rejected.	Regarding this clause we would like to highlight following points : 1. In point 3 you have mentioned SN 12,12.1,13 of “(A) FILTER OF APPLICANTS – CHECKLIST of INITITAL FILTER EVALUATION CRITERIA”; . The above mentioned checklist contains only SN 1 to SN 11. Please clarify. Regarding this clause we would like to highlight following points : Key Dates 6 and 9 under Section IX. Particular Conditions (PC) Part A – Contract Data ‘Table: Summary of Sections’ KD6 is mentioned for different sections as : D+30 , D+58 , D+110, D+130 , D+70 And KD9 is mentioned for different sections as: On Completion of DLP of complete works. Please confirm on the firm dates for these two Key Milestones which can enable us to confirm for these Key Dates .	Kindly refer to Corrigendum/Addendum, Item No 14 Kindly refer to Corrigendum/Addendum, Item No 272

PART A Pre Bid Minutes

46	32.1	<p>Bids will be compared in Indian Rupees only. This will be achieved by conversion of the Foreign Currency portion of the Bid into Indian Rupees by using the Exchange (Selling) Rates at the close of business of the State Bank of India 28 (twenty eight) days before the latest date of Bid submittal, and then adding the same to the Indian Rupee portion of the Bid.</p> <p>In case this particular day happens to be a holiday, the exchange rate at the opening of the business of the State Bank of India on the next working day will be considered.</p>	<p>Historical date of exchange rates is not provided by SBI in their website. We understand that we have approach the bank procedurally for exchange rates of specific dates. This being a cumbersome task, we kindly request you to clarify if you can advise some other references like RBI, Oandaetc where such historical exchange rates are readily available. Also, such sources are accepted in many other government tenders. Pl confirm.</p> <p>This period is too long , What about if there is frequent Exchange Rate changes</p> <p>Please clarify which Exchange (Selling) Rates at of the State Bank of India will be used : Bill Selling Exchange Rate of SBI Or TT Selling Exchange rate of SBI</p>	<p>This is a standard clause applicable to all bidders. Hence no need to modify. Exchange selling rate of SBI will be applicable</p>
47	34.1	<p>At this time the Employer does not intend to execute certain specific parts of the Works by sub-contractors selected in advance.</p>	<p>Request for the clarification of the clause</p>	<p>Clause is self explanatory</p>
48	35.2	<p>In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid price by adjusting the Bid price as follows: A. making any corrections for errors pursuant to ITB 31.2; B. making appropriate adjustments for conditions, qualifications, deviations, etc. pursuant to ITB 14.12. C. converting the amount resulting from applying (A) and (B) above to a single currency in accordance with ITB 32.1;</p>	<p>-</p>	<p>Kindly refer to Corrigendum/Addendum, Item No 15</p>
49	42.1	<p>The Performance Guarantee required in accordance with Clause 4.2 of the GC shall be for an amount as specified in Section IX. Particular Conditions, Part A – Contract Data in the form of a bank guarantee issued from an Indian Scheduled bank (excluding Cooperative Banks) or from a scheduled Foreign Bank having business office in India as defined in Section 2(e) of RBI Act 1934 read with Second Schedule in the types and proportions of currencies in which the Contract Price is payable.</p>	<p>-</p>	<p>Kindly refer to Corrigendum/Addendum, Item No 15</p>
50	43.1	<p>The Bidder shall submit full details of the identity of the proposed parties who would respectively provide or issue: · the Performance Security in accordance with Sub-Clause 4.2 of the GC; · parent company Undertakings in accordance with Clause 6 of the PC · parent company Guarantees in accordance with Clause 6 of the PC;</p>	<p>In case where the parent company itself is a consortium partner along with its 100% subsidiary company , then as per our understanding there is no need for the parent company guarantee and Parent company undertaking, Pl confirm</p>	<p>Parent companu undertaking is required for portion of work to be executed by subsidiary company.Bidder request declined. Provision of tender clause will prevail.</p>
51	43.3	<p>If the Bidder comprises a Consortium, a parent company of each Member of such Consortium will be required to execute the Undertakings and Guarantees referred to in sub-paragraphs (b) and (c) of ITB 43.1above.</p>	<p>As per this clause successful bidder has to submit Parent Company Undertaking and Parent Company Guarantee from each Member of its Consortium, In the required format given in Part 3 : Section X : Contract Forms</p> <p>We propose to submit a Comfort letter from our Parent Company instead of PCG and PCU. Same process has been followed earlier in other projects of India.</p>	<p>Agreed, Comfort letter will be accepted.</p>

Part I		Annexure-II-A (Tool Kit for e-tender Portal)		
52	4	The User shall indemnify and hold harmless the Payment Gateway Service Provider(s) and Merchant and their respective officers, directors, agents, and employees, from any claim or demand, or actions arising out of or in connection with the utilization of the Services.	Request deletion of the clause: - The User shall indemnify and hold harmless the Payment Gateway Service Provider(s) and Merchant and their respective officers, directors, agents, and employees, from any claim or demand, or actions arising out of or in connection with the utilization of the Services.	Bidder request declined. Provision of tender clause will prevail.
Part I		Section-III (EVALUATION AND QUALIFICATION CRITERIA		
Annexure-III-A1 PRE-QUALIFICATION (INITIAL FILTER) DOCUMENTS				
53	Nil	Annexure IIIA	We request you to please consider Sub-contractor' experiences for PQ purposes We recommend & request NMRCL to evaluate the bid on QCBS grading system instead of Lowest price basis.	Bidder request declined. Provision of tender clause will prevail.
54	A 11	Is the applicant not having the experience of systems& software integration of all telecommunication sub-systems required for the Telecom segment of the Project?	-	Kindly refer addendum/corrigendum , item no 16
55	T2	The financial year as applicable in the country of origin of the bidders would be considered. The 'last financial year' will be the latest financial year that ended on or before 31.12.2015.	As you are aware that the Tender NITL01/2016 had been issued in Aug 2016 and we are in Oct 2016 now . Till now audited results of Financial year ending at 31.03.2016 are also available. Even In Signaling Tender NIS01/2016 last financial year' allowed is the latest financial year that ended on or before 31.03.2016. So we request you to change this requirement as following : The financial year as applicable in the country of origin of the bidders would be considered. The 'last financial year' will be the latest financial year that ended on or before 31.12.2015 or 31.03.2016.	Kindly refer addendum/corrigendum , item no 17
56	T3	This will be based upon the Qualification and experience of Project Leader (Project Leader and Management team has been defined in the 'Pro-forma Section 4 of the Initial Filter Questionnaire'). The minimum requirements to 'Pass' this criteria is that the proposed Project Leader should have total experience of minimum 15 years and should have been the Project Head in at least one Project in the last 10 years Metro / Railways Telecommunication System	-	Kindly refer addendum/corrigendum , item no 18
57	T4	Average Annual Turn Over The minimum requirements to 'Pass' this criteria is that the Average Annual Turn Over for the last five financial years for manufacture, supply, installation, testing and commissioning of Telecommunication systems only (in terms of rupee equivalent adjusted to last date of the financial year that ended on or before 31.12.2015. by assuming 5% escalation for Indian Rupee and 2% for foreign currency per year) shall not be less than INR 1200Million.	3) Refer pg no 192 of the tender which is part of Initial filer questionnaire Annual financial turnover (for manufacturing of telecommunication system) Does it mean that- bidder need to give revenue details of "manufacturing of telecommunication system" Bidder assumes that the revenue for telecommunication means - Design, Supply, installation, Testing, Commissioning and maintenance of CCTV, PA, PIDS, MCS, ACS, SCADA, Networking systems. As this project is for Metro Works, only those bidders who has past expereince of having successfully executed Telecommunication works in Railways domain should be permitted. Therefore, this clause may be amended as below : Average Annual Turn Over The minimum requirements to 'Pass' this criteria is that the Average Annual Turn Over for the last five financial years for manufacture, supply, installation, testing and commissioning of Telecommunication systems on Railways, Metro Railway, LRT, High Speed Railways, Suburban Railway Transit System only (in terms of rupee equivalent adjusted to last date of the financial year that ended on or before 31.12.2015. by assuming 5% escalation for Indian Rupee and 2% for foreign currency per year) shall not be less than INR 1200Million.	Clause is self explanatory. Kindly refer to Corrigendum/Addendum, Item No 19 Bidder request declined. Provision of tender clause will prevail. Kindly refer to Corrigendum/Addendum, Item No 19

			<p>Please modify the clause as followed: The minimum requirements to 'Pass' this criteria is that the Average Annual Turn Over for the last five financial years for manufacture, supply, installation, testing and commissioning of Telecommunication systems only (in terms of rupee equivalent adjusted to last date of the financial year that ended on or before bid submission date by assuming 5% escalation for Indian Rupee and 2% for foreign currency per year) shall not be less than INR 1200Million.</p> <p>As you are aware that the Tender NITL01/2016 had been issued in Aug 2016 and we are in Oct 2016 now . Till now audited results of Financial year ending at 31.03.2016 are also available. Even In Signaling Tender NIS01/2016 last financial year' allowed is the latest financial year that ended on or before 31.03.2016. So we request you to change this requirement as following : The financial year as applicable in the country of origin of the bidders would be considered. The 'last financial year' will be the latest financial year that ended on or before 31.12.2015 or 31.03.2016.</p> <p>We kindly request you to amend the clause as below: "The minimum requirements to 'Pass' this criteria is that the Average Annual Turn Over for the last five financial years for Manufacture, Supply, installation, testing and commissioning of Telecommunication systems only (in terms of rupee equivalent adjusted to last date of the financial year that ended on or before 31.12.2015 by assuming 5% escalation for Indian Rupee and 2% for foreign currency per year) shall not be less than INR 1200 Million." Justification:We believe that for a tender of this nature which deals with integration of different sub-systems, the requirement of having manufacturing credentials for the bidder is highly restrictive from a participation point of view. Hence, we request to remove the manufacturing word. Removing "manufacture" would also encourage participation from large Master System Integrator's, that can bring in the benefits of competitive pricing to NMRCL through their sourcing network and project management strength besides ensuring timely completion of the project.</p>	<p>Kindly refer to Corrigendum/Addendum , Item No19</p>
58	T5	<p>Net worth of tenderer during last audited financial year should be > INR 60 crore. In case of joint venture /Consortium, Net worth will be based on the percentage participation of each Member. Example: Let Member-1 has percentage participation = M and Member-2 has =N. Let the Net worth of Member-1 is A and that of Member-2 is B, then the Net worth of JV will be = AM+BN/100</p>		<p>Kindly refer to Corrigendum/Addendum Item No 19</p>

PART A Pre Bid Minutes

59	T6 - viii	<p>a) Lead partner must have a minimum of 40% participation in the JV / Consortium.</p> <p>b) Each Partner shall have minimum 26% participation. 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, all the requirements of clause T6(b) and Section C – Bid Capacity Evaluation of this document shall be met by substantial partners only.</p>	<p>We request you to please add Minimum Four Consortium Partners instead of Three and change the % stake accordingly. In case of Consortium, Foreign Partner and their Indian Company/Representative should also be part keeping PQ credentials and legal aspects in view. So, with this, Consortium becomes just 2 party. Hence, plz accept and revise.</p>	<p>Bidder request declined. Provision of tender clause will prevail.</p>
60	T6 - a (i)	<p>The bid for this work will be considered only from those bidders (proprietorship firms, partnerships, firms, companies, corporations, consortia or joint ventures) who meet requisite eligibility criteria prescribed in Clause T6 Qualification Criteria in this document. In the case of a JV or Consortium, all members of the Group shall be jointly and severally liable for the performance of whole contract.</p>	<p>Can a Indian subsidiary of a foreign bidder, both of whom are substantial members of consortium, use the financial credentials of the foreign parent company to meet the requirement as set forth in clauses T1, T2, T4, T5? With a support letter from the parent company to support the working capital and any other financial obligations needed to execute the project.</p>	<p>Agreed, provided a Parent Company Guarantee is issued as per proforma enclosed. Pl refer addendum/corrigendum, item no.20 & 44</p>
61	T6 a viii (d)	<p>In case of JV / Consortium, change in constitution or percentage participation shall not be permitted at any stage after their submission of application otherwise the applicant shall be treated as nonresponsive. Lead partner shall be one of the substantial partners based on whose strength work experience is accounted for in meeting the criteria of Clause T6 (b)</p>	<p>We understand that if a consortium is qualified for clause T6 (b), and all consortium members are substantial partners with joint and several liability. There should be freedom to choose any substantial partner as a Lead Partner.</p> <p>Therefore we request you to change this clause as following :</p> <p>In case of JV / Consortium, change in constitution or percentage participation shall not be permitted at any stage after their submission of application otherwise the applicant shall be treated as nonresponsive.</p> <p>"This Clause may be amended as below: In case of JV / Consortium, change in constitution or percentage participation shall not be permitted at any stage after their submission of application otherwise the applicant shall be treated as non-responsive. Lead partner shall be one of the substantial partners based on whose strength work experience is accounted for in meeting the criteria of Clause T6 (b). Any substantial partner can be a lead partner. Substantial partner should meet the criteria of clause T6(b) for the work experience. "</p> <p>We request you to replace this clause by following :</p> <p>d) In case of JV / Consortium, change in constitution or percentage participation shall not be permitted at any stage after their submission of application otherwise the applicant shall be treated as nonresponsive. Lead partner shall be one of the substantial partners based on whose strength work experience is accounted for in meeting the criteria of Clause T6 (b) and will have minimum 26 % share in work. However, In case of consortium members from the same parent company or under common control, Lead partner can be any member who will have minimum 26% share in work.</p>	<p>Bidder request declined. Provision of tender clause will prevail.</p> <p>Bidder request declined. Kindly refer to Corrigendum/Addendum , Item No 20</p>

62	B-T6-b-i-(a)	<p>a) Work Experience Requirements for Telecommunication Systems:</p> <p>The applicant (or the concerned member of JV/Consortium) should have successfully carried out the following work(s) in the last 10 (TEN) years ending 31.12.2015, as given below. If the work was done in another JV / Consortium, the value in proportion of participation in that JV / Consortium by the member only will be considered. The Tenderer should have completed following telecom system integration projects in the last 10 Years (details also in given in Annexure 1, 1-A & 2 of Part II of Initial Filter document.</p> <p>(i) At least 02 Telecommunication System Works (details shall be submitted as per proforma enclosed in Annexure 2 of Part II of Initial Filter document) have been executed outside the country of origin.</p> <p>(ii) Telecommunication work experience (for which details shall be submitted in Annexure 2 of Part II of Initial Filter document) shall include integration of at least –PIDS, PAS, CCTV, FOTS, TETRA, Telephony subsystems of telecom systems.</p> <p>The applicant (or the concerned member in case of JV / Consortium) must have completed at least one work of similar nature costing 1540 Million or more at the price level of 31-03-2015 OR a work of similar nature over a set of more than 29 stations. If the above criteria is being fulfilled by the foreign partner of the JV / Consortium and the work was done in the country of origin of the foreign partner then in addition to this, the foreign partner must have done at least one work of similar nature costing INR 96 Crores or more at price level of 31-03-2015 or a work comprising more than 18 stations, outside the country of origin of the foreign partner.</p>	<p>As the telecommunication works are being done on metro environment, it involves technical interfaces between each telecom subsystem and other critical systems like Rolling Stock, Signalling, AFC, Power SCADA and Traction and E&M etc. For Rolling Stock interface, the Telecom Contractor shall be the leader contractor as per clause 1.2.5. Appendix -A, Chapter 12, TS. Therefore, it should be mandatory for bidders to have past experience of having successfully interfaced with those systems in the past. In view of this, we request addition of point (iii) as below. The same practice has been followed in recently floated telecom tenders of Metros like MEGA Metro.</p> <p>Work Experience Requirements for Telecommunication Systems:</p> <p>The applicant (or the concerned member of JV/Consortium) should have successfully carried out the following work(s) in the last 10 (TEN) years ending 31.12.2015, as given below. If the work was done in another JV / Consortium, the value in proportion of participation in that JV / Consortium by the member only will be considered. The Tenderer should have completed following telecom system integration projects in the last 10 Years (details also in given in Annexure 1, 1-A & 2 of Part II of Initial Filter document.</p> <p>(i) At least 02 Telecommunication System Works (details shall be submitted as per proforma enclosed in Annexure 2 of Part II of Initial Filter document) have been executed outside the country of origin.</p> <p>(ii) Telecommunication work experience (for which details shall be submitted in Annexure 2 of Part II of Initial Filter document) shall include integration of at least –PIDS, PAS, CCTV, FOTS, TETRA, Telephony subsystems of telecom systems.</p>	<p>Bidder request declined. Kindly refer to Corrigendum/Addendum , Item No 20</p>
63		<p>OR</p> <p>The applicant (or the concerned member in case of JV / Consortium) must have completed at least two works of similar nature each costing INR 960 Million or more at the price level of 31-03-2015 OR two works of similar nature, with each work over a set of more than 18 stations. If both the works are done by the foreign partner of the JV / Consortium, then either, one work should have been done outside the country of origin of the foreign partner, or if both the works are in the country of origin of the foreign partner, then in addition to this, the foreign partner must have done at least one work of similar nature costing INR 770 Million or more at price level of 31-03-2015 or a work comprising more than 14 stations, outside the country of origin of the foreign partner.</p> <p>OR</p> <p>The applicant (or the concerned member in case of JV / Consortium) must have completed at least three works of similar nature each costing INR 770 Million or more at the price level of 31-03-2015 OR three works of similar nature, with each work over a set of more than 14 stations. If all the three works or two out of the three works are done by the foreign partner of the JV / Consortium, then at least one out of the three works should have been done outside the country of origin of the foreign partner.</p> <p>Notes:</p>	<p>"This Clause may be amended as below:</p> <p>Work Experience Requirements for Telecommunication Systems:</p> <p>The applicant (or the concerned member of JV/Consortium any substantial partner/member in case of JV/ Consortium) should have successfully carried out the following work(s) in the last 10 (TEN) years ending 31.12.2015, as given below. If the work was done in another JV / Consortium, the value in proportion of participation in that JV / Consortium by the member only will be considered. The Tenderer should have completed following telecom system integration projects in the last 10 Years (details also in given in Annexure 1, 1-A & 2 of Part II of Initial Filter document.</p> <p>(i) At least 02 Telecommunication System Works (details shall be submitted as per proforma enclosed in Annexure 2 of Part II of Initial Filter document) have been executed outside the country of origin or in India in a Railways, MRT and High Speed Railways works.</p> <p>(ii) Telecommunication work experience (for which details shall be submitted in Annexure 2 of Part II of Initial Filter document) shall include integration of at least –PIDS, PAS, CCTV, FOTS, TETRA, Telephony subsystems of telecom systems either in India or outside the country of origin in a Railways, MRT and High Speed Railways works.</p> <p>(iii) Integration of Telecommunication Systems with all other System including hardware & software (Signaling, Rolling Stock, Track, E&M, AFC, Traction, Depot) in atleast one Metro Rail Project/LRT System/Suburban Rail System/High Speed Rail.</p>	

64	B-T6-b-i-(a)	<p>i. Deleted.</p> <p>ii. The bidder shall mention the name of the projects to be used for each of Clause T6 (b) i (a) along with documentary evidence in the form of client certificate(s).</p> <p>iii. The bidder shall submit details of work executed by them in the Performa of Annexure-1 and Annexure 1A of Initial Filter Questionnaire for the works to be considered for qualification of work experience criteria. Documentary proof such as completion certificates from client clearly indicating the nature/scope of work, actual completion cost and actual date of completion for such work should be submitted.</p> <p>Supporting documents related to Work Experience, Financial & Technical eligibility criteria enclosed with the bid, other than English language should accompany a translated copy by a certified translator in English and will have to be endorsed/attested by Indian embassy or any authorized / recognized agency of India Embassy, where the supporting documents is being issued. The contact address & identification of certified translator must be mentioned at the end of the translated copy of the document.</p> <p>However, such documents provide by bidders from a country which has signed Hague legislation convention 1961 is not required to be endorse by Indian embassy. If it carries confirming Apostille certificate.</p> <p>The bidder should provide the relevant contact number and E-mail ID, Contact No. along with the postal address in English, of issue authority/agency of such documents for verification purpose.</p> <p>In case the work is executed for private client, copy of work order, bill of quantities, bill wise details of payment received certified by C.A., T.D.S certificates for all payments received and copy of final/last bill paid by client shall also be submitted.</p> <p>iv. Value of successfully completed portion (taken over by the client and operational, even if partial) of any on-going work up to 31.12.2015 will also be considered for qualification of work experience criteria.</p> <p>v. For completed works, value of work done shall be updated to 31.12.2015 price level assuming 5% inflation for Indian Rupees every year and 2% for foreign currency portions per year. The exchange rate of foreign currency shall be applicable 28 days before the submission date of bid.</p> <p>vi. In case of joint venture / Consortium, full value of the work, if done by the same joint venture shall be considered. However, if the qualifying work(s) were</p>	<p>We request you to modify the clause as below: The applicant (or the concerned member in case of JV / Consortium) must have completed at least one work of similar nature costing 1000 Million or more at the price level of 31-03- 2015 OR a work of similar nature over a set of more than 29 stations. If the above criteria is being fulfilled by the foreign partner of the JV / Consortium and the work was done in the country of origin of the foreign partner then in addition to this, the foreign partner must have done at least one work of similar nature costing INR 96 Crores or more at price level of 31-03-2015 or a work comprising more than 18 stations, outside the country of origin of the foreign partner.</p> <p>We read as "must have completed at least one work of similar nature(includes. Large Infra)costing 1540 Million or more at the price level of 31-03-2015</p> <p>We request you to modify the clause as below: The applicant (or the concerned member in case of JV / Consortium) must have completed at least three works of similar nature each costing INR 450 Million or more at the price level of 31-03-2015 OR three works of similar nature, with each work over a set of more than 14 stations. If all the three works or two out of the three works are done by the foreign partner of the JV / Consortium, then at least one out of the three works should have been done outside the country of origin of the foreign partner.</p>	
----	--------------	--	--	--

PART A Pre Bid Minutes

65	B-T6-b-i-(a)	done by them in JV/Consortium having different constituents, then the value of work as per their percentage participation in such JV/Consortium shall be considered.	<p>We request you to modify the clause as below:</p> <p>"Value of successfully completed portion (taken over by the client and operational, even if partial) of any on-going work up to bid submission date will also be considered for qualification of work experience criteria"</p>	Kindly refer to Corrigendum/Addendum, Item No 20
			<p>Bidder requests to include the following eligibility criteria so as to encourage more healthy competition.</p> <p>iii) A minimum number of 01 (One) *Similar nature contract work involving minimum four telecom sub-systems or more and costing INR 1540 million or more at price level of 31/12/2015, that have been satisfactorily and substantially completed as a prime contractor (single entity or JV member) between 1st January 2006 and 1st January 2016.</p> <p>* Where Similar Nature Contract works shall be determined based on the complexity and methods as required in the scope of works of this tender.</p>	Bidder request declined. Kindly refer to Corrigendum/Addendum, Item No 20
			<p>Telecommunication work experience (for which details shall be submitted in Annexure 2 of Part II of Initial Filter document) shall include integration of at least any two PIDS, PAS, CCTV, FOTS, TETRA, Telephony subsystems of telecom systems.</p> <p>We request NMRCL to please revised to at least 3 integration out of 6 systems (PIDS, PAS, CCTV, FOTS, TETRA, Telephony subsystems of telecom systems).</p>	Bidder request declined. Kindly refer to Corrigendum/Addendum, Item No 20
66	B-T6-b-i-(a)		<p>Please add MCS, SCADA, MATV as these are part of the Telecom system under this Tender (MCS, SCADA is integral part of this Telecom package (Reference Scope of Work)</p> <p>Please include/change to, "shall include integration of at least 5 systems - PIDS, PAS, CCTV, FOTS, TETRA, Telephony, MCS, SCADA". We assume that integration/Interface of any 5 System of telecom sub system shall be considered as required work experience</p>	
			<p>Please Consider the below request:</p> <p>At least 01 Telecommunication system works (details shall be submitted as per proforma enclosed in Annexure 2 of part II of Initial filter document) have been executed outside the country of origin and at least 01 Telecommunication works (details shall be submitted as per proforma enclosed in annexure 2 of part II of Initial filter document) can be ongoing project</p>	Bidder request declined.
			<p>We request NMRCL to please revised to at least 4 integration out of 6 systems (PAS, CCTV, Access Control, FOTS, Telephony subsystems of telecom systems).</p> <p>OR</p> <p>We request NMRCL to please revised to at least 3 integration out of 6 systems (CCTV, Access Control, Telephony subsystems of telecom systems). Similar technologies are also executed in non metro/Infrastructure company projects. we request NMRCL to consider the project reference in non metro areas such as infrastructure complex (educational institutes, ports, oil & gas companies, Smart cities. Wipro has a competition certificate PNU wherein we are meeting 4 sub system as per the eligibility criteria</p>	Pl refer addendum/corrigendum, item no.20

		<p>We believe that this requirement for having foreign experience is very restrictive and not exactly of any potential benefit to the Employer. On the contrary, we feel that this will prohibit competition in the tender and reduce meaningful participation from serious applicants with excellent credentials.</p> <p>Hence, in order to broad base the competition, we humbly suggest to change the criteria as follows:</p> <p>At least 02 Telecommunication System Works (details shall be submitted as per proforma enclosed in Annexure2 of Part II of Initial Filter document) have been executed outside/within the country of origin.</p>	<p>PI refer addendum/corrigendum, item no.20</p>
		<p>Bidder requests to clarify whether the currency in this particular case is INR.</p>	<p>Bidders understanding is correct</p>
<p>67</p>	<p>B-T6-b-i-(a)</p>	<p>We request you to kindly modify this clause as follows.</p> <p>Telecommunication work experience (for which details shall be submitted in Annexure 2 of Part II of Initial Filter document) shall include integration of at least ANY THREE of –PIDS, PAS, CCTV, FOTS, TETRA, Telephony subsystems of telecom systems.</p> <p>Generally Metros in India including DMRC for the Telecommunication Systems project is divided into three to four subsystems and are awarded individually. Also, Metro Authorities allow the Telecommunication systems experience in other domain as well for the purpose prequalification.</p> <p>Thus the experience of Telecommunication systems including all the subsystems in Metro Rail projects is very restrictive to a few Indian telecom system integrator companies.</p> <p>Justification: From our experience, we feel that the experience of having any of the following will meet this requirement:</p> <ol style="list-style-type: none"> 1) Signaling & Train Control /CBTC System or 2) Large Airport Telecommunication system or 3) Any other single communication Project having CCTV System, IPBAX, PA system, Radio System, SCADA, Access control, Fiber and Network equipment etc. 	<p>Bidder request declined. Kindly refer to Corrigendum/Addendum, Item No 20</p>

	B-T6-b-i-(a)		<p>There is contradiction in these tender clauses when compared to Note (IV) and Note (V). While the eligibility has to be met at price levels of 31-03-2015, however as per note (IV) , Value of successfully completed portion (taken over by the client and operational, even if partial) of any on-going work up to 31.12.2015 will also be considered for qualification of work experience criteria. As per note (V) For completed works, value of work done shall be updated to 31.12.2015 price level.</p> <p>To be more coherent, You are requested to make price levels of 31.12.2015 at all places in this clause. And the clause may be amended as below;</p> <p>The applicant (or the concerned member in case of JV / Consortium) must have completed at least one work of similar nature costing 1540 Million or more at the price level of 31-12-2015 OR a work of similar nature over a set of more than 29 stations. If the above criteria is being fulfilled by the foreign partner of the JV / Consortium and the work was done in the country of origin of the foreign partner then in addition to this, the foreign partner must have done at least one work of similar nature costing INR 96 Crores or more at price level of 31-12-2015 or a work comprising more than 18 stations, outside the country of origin of the foreign partner.</p> <p>OR OR</p>	PI refer addendum/corrigendum, item no.20
			<p>Bidder request following modifications in the tender. “ If one of the subsidiary of parent company full fill the eligibility criteria another subsidiary registered in India will be considered as eligible on the strength of sister concern provided parent company who own both subsidiary gives Parent company Undertaking” (Undertaking on the performance of all its Local entity obligation on reasonable basis & provide technical, operation support to local entity to perform quality, timely supply, installation and achieving operation acceptance including performance and warranty through Local entity)</p>	Bidder request declined, subsidiary can quote only on strenth of Parent CompanyPI refer addendum/corrigendum, item no.20 & 46
68	T6.b.i.b	<p>b) Length of Time in Business This will be evaluated based on information provided in Annexure-1ofInitial Filter Questionnaire and at S.No.15 of Proforma Section 3 given in Initial Filter Questionnaire.</p> <p>In case of JV/Consortium formation, at least one of the substantial members should be in Telecommunication Works business for minimum 10 years. Requirement: 10years (minimum).</p>	<p>Our understanding is that if the bidder is an individual entity, the requirement for minimum 10 years of telecommunication works business experience shall not apply. The bidder’s credentials will be evaluated based on the project experience which the bidder submits as per the proforma available.</p> <p>This minimum requirement of 10 years shall be required ONLY in case of JV/ Consortium. Kindly confirm.</p>	Bidder request declined. Provision of tender clause will prevail.
			<p>Length of time in business : This will be evaluated based on information provided in Annexure-1 of Initial Filter Questionnaire and at S. No. 15 of Proforma Section 3 given in Initial Filter Questionnaire. In case of JV/Consortium formation, at least one of the substantial members should be in Telecommunication Works business for minimum 10 years. Requirement: 10 years 5 Years (minimum).</p>	Bidder request Declined. PI refer addendum/corrigendum, item no.20
69	T6C	<p>Maximum of the value of Telecommunication works executed in any one year during the last five financial years (updated to 31.12.2015 price level assuming 5% inflation for Indian Rupees every year and 2% for foreign currency portions per year)</p>	<p>As you are aware that the Tender NITL01/2016 had been issued in Aug 2016 and we are in Oct 2016 now . Till now audited results of Financial year ending at 31.03.2016 are also available. Even In Signaling Tender NIS01/2016 last financial year’ allowed is the latest financial year that ended on or before 31.03.2016. So we request you to change this requirement as following : (updated to 31.03.2016 price level assuming 5% inflation for Indian Rupees every year and 2% for foreign currency portions per year)</p>	PI refer addendum/corrigendum, item no.21
Part 1		Annexure-III-A1 INITIAL FILTER DOCUMENTS - INITIAL FILTER QUESTIONNAIRE		
70	Contents of Each Section	(CONTENTS OF EACH SECTION),	-	PI refer addendum/corrigendum, item no.22

PRO-FORMA			
71		(PRO-FORMA LETTER OF APPLICATION)	
	3 (17a)	Performance Record: Applicants should scrutinise the contract description contained in this Initial Filter Brochure and compile a list showing their previous experience of similar contracts completed during the last ten (10) yearsThe applicant must demonstrate experience in all areas covered by this contract including design, manufacturing, supply, installation and commissioning of systems of sizes and technology comparable to those contemplated under this contract and also show capability of full integration of subsystems with Rolling Stock and other project elements. Ability to provide these systems in a short time period on schedule must be demonstrated Further information and literature associated with vehicle performance and reliability, together with technology transfer achieved on previous contracts, experience in supervision of maintenance and relevant experience of the applicant and each constituent member and clearly referenced shall be enclosed in Section 3. All material should be clearly referenced as being in response to this Question 17a.	<p>We kindly request you to amend the clause as below:</p> <p>Performance Record: Applicants should scrutinise the contract description contained in this Initial Filter Brochure and compile a list showing their previous experience of similar contracts completed during the last ten (1o) years. The applicant must demonstrate experience in all areas covered by this contract including design, Manufacturing, supply, installation and commissioning of systems of sizes and technology comparable to those contemplated under this contract and also show capability of full integration of subsystems either in Metro projects or other large infrastructure projects like Airports. with Rolling stock and other project elements. Ability to provide these systems in a short time period on schedule must be demonstrated Further information and literature associated with vehicle performance and reliability, together with technology transfer achieved on previous contracts, experience in supervision of maintenance and relevant experience of the applicant and each constituent member and clearly referenced shall be enclosed in Section 3. All material should be clearly referenced as being in response to this Question 17a</p> <p>Justification: As discussed above, the requirement for having manufacturing is restrictive. We also propose to change the criteria so as to incorporate integration experience of similar projects like Airports rather than limiting to only Metro environment.Kindly confirm.</p>
			Pl refer addendum/corrigendum, item no.23 Pl refer addendum/corrigendum, item no.24
72	3 (17) b	<p>Work in Hand: Applicant or each constituent member should indicate, in the form below, details for each similar contract / comiiltment which is not yet completed or for which letter of intent or acceptance has been received. (Applicants are to present this information in the format mentioned below but on sheets which are to be included in the Questionnaire).</p> <p>1. Have you (each constituent member of the Joint Venture/Consortium) provided details required in Annexure 2 and 2A? [Y] / [N]</p> <p>(Use a separate sheet for each Contract and include in the Questionnaire)</p>	<p>We kindly request you to amend the clause as below:</p> <p>Work in Hand: Applicant or each constituent member should indicate, in the form below, details for each similar contract / commitment which is not yet completed or for which letter of intent or acceptance has been received. (Applicants are to present this information in the format mentioned below but on sheets which are to be included in the Questionnaire).</p> <p>1. Have you (each constituent member of the Joint Venture/Consortium) provided details required in Annexure 2 and 2A? [Y] / [N]</p> <p>(Use a separate sheet for each Contract and include in the Questionnaire)</p> <p>Justification We kindly propose to list out our total contractual commitments on a consolidated basis. This will cover our projects under similar nature as well. Kindly confirm.</p>
			Bidder request declined. Provision of tender clause will prevail.
73	3 (17c)	Note: The financial year as applicable in the country of origin of the bidders would be considered. The 'last financial year' would be the latest financial year that ended on or before 31.12.2015.	<p>We kindly request you to amend the clause as below:</p> <p>Annual financial turnover (for manufacturing of Telecommunication System only) as on 'last date of the financial year that ended before the date of</p> <p>As you are aware that the Tender NITL01/2016 had been issued in Aug 2016 and we are in Oct 2016 now . Till now audited results of Financial year ending at 31.03.2016 are also available. Even In Signaling Tender NIS01/2016 last financial year' allowed is the latest financial year that ended on or before 31.03.2016. So we request you to change this requirement as following : (updated to 31.03.2016 price level assuming 5% inflation for Indian Rupees every year and 2% for foreign currency portions per year)</p>
			Pl refer addendum/corrigendum, item no.25
74	3 annex 1	(PRO-FORMA SECTION 3), Annexure 1	
			Pl refer addendum/corrigendum, item no.26
75	3 annex 2	(PRO-FORMA SECTION 3), Annexure 2	
			Pl refer addendum/corrigendum, item no.27
76	5 annex5	Actuals for previous five years ending on or before 31.12.2015	<p>As you are aware that the Tender NITL01/2016 had been issued in Aug 2016 and we are in Oct 2016 now . Till now audited results of Financial year ending at 31.03.2016 are also available. Even In Signaling Tender NIS01/2016 last financial year' allowed is the latest financial year that ended on or before 31.03.2016. So we request you to change this requirement as following : Actuals for previous five years ending on or before 31.12.2015 or 31.03.2016.</p>
			Pl refer addendum/corrigendum, item no.28

PART A Pre Bid Minutes

77	6	If an Applicant (or member of a Joint Venture/Consortium) is wholly or significantly owned by a holding or parent companies, the information relating to audited accounts and financial statement (as describe above) shall be provided for such intermediate or ultimate holding or parent companies. This information shall be provided in respect of all applicants, whether applying individually or as Joint Venture/Consortium together with Auditor's certification	We understand that financial credentials of Holding and parent companies of consortium members are not used in Evaluation and Qualification Criteria. Hence only audited accounts and financial statement of consortium members are required for submission purpose. Please confirm	The clause is self explanatory.
78	6annex7	Contract non-performance did not occur during the last two years specified in Clause-T6 a (xi) of Annexure III-A: Pre-Qualification (Initial Filter) Documents		Pl refer addendum/corrigendum, item no.29
Part I Section-IV (Bidding Forms)				
79	2.2 (2)	We hereby certify that neither we nor any other member of our joint venture or any of our subcontractors are in any of the following situations:	Bidder requests modification: - We hereby certify that neither we nor any other member of our joint venture or any of our subcontractors are in any of the following situations which may adversely impact the performance of obligations under this Tender:	Bidder request declined. Provision of tender clause will prevail.
80	2.2 (7)	We, as well as members of our joint venture and our subcontractors authorise AFD/KfW to inspect accounts, records and other documents relating to the procurement and performance of the Contract and to have them audited by auditors appointed by AFD/KfW.	Request modification: - We, as well as members of our joint venture and our subcontractorsauthorise AFD/KfW to inspect accounts, records and other documents relating to the procurement and performance of the Contract and to have them audited by auditors appointed by AFD/KfW.However, documents related to pricing, strategy etc. of the Bidder shall be excluded from the audit.	Bidder request declined. Provision of tender clause will prevail.
3 Schedule Annexure IVA(Instruction for price bid)				
81	A.1	This is a fixed lump sum price Contract for Design, Manufacture, Supply, Installation, Testing and Commissioning of Telecommunication System (details of Works including configuration to be supplied are indicated in the Section IX. Particular Conditions, Part A – Contract Data ‘Table – Summary of Sections’) for Nagpur Metro Rail Project. Bidder shall quote its fixed lumpsum price inclusive of all taxes, levies, duties and other charges, including taxes to be deducted at source, leviable and payable to the authorities.	Taxes & Duties are subject to change especially after the introduction of Goods and Service Tax (GST), since it is very difficult to predict the percentage of future taxes & duties at this point of time, we suggest revision in the all inclusive price in order to mitigate the additional tax burden on the contractor if any, after the new tax & duties enactment	Kidly refer to PC Clause 51 (Sub-clause 13.7 – Adjustments for Changes in Legislation) , which is self explanatory. Annexure IV Modified, Kindly refer to Corrigendum/Addendum, Item No 30
			As prices are inclusive of all taxes and duties, please clarify on the reimbursement procedure of Customs duty and Excise duty. Reimbursement of Customs duty and Excise duty will be done on the basis of submission of proof or will be reimbursed along with contract price build in respective milestones. Please clarify.	Though quote is incl of all taxes and duties(Breakup has to be given in the quote) Final payment will be the including the cost of taxes on submission of Valid and relevant documents
			Request you to clarify Tax breakup & Details of Taxes deducted at source and applicable percentage. Moreover in the details of taxes /Duties /levies etc which will be provided as given on page 17 of pricing document includes Work contract Tax and not TDS Please clarify whether this TDS percentage is to be mentioned in Works contract Tax column	WCT is 2% and TDS will be deducted as per income tax act 1961
82	A3.2	Instructions for completing the Pricing Document- Quantity variation: Variation of any item in Appendix J due to change in scope of work during execution, provided the change in Contract value is within ±25%, shall be applied at the unit rate quoted by the Tenderer in Appendix J of Schedules (Pricing Document) and no additional amount whatsoever shall be payable to the Contractor (pricing mechanism as per Annexure 5 of Pricing Document), The Employer may exercise any increase in quantity on any date up to scheduled opening of the last section	We request to change the same as below: Variation of any item in Appendix J due to change in scope of work during execution, provided the change in Contract value is within ±10%, shall be applied at the unit rate quoted by the Tenderer in Appendix J of Schedules (Pricing Document) and no additional amount whatsoever shall be payable to the Contractor (pricing mechanism as per Annexure 5 of Pricing Document), The Employer may exercise any increase in quantity on any date up to scheduled opening of the last section	Bidder request declined. Provision of tender clause will prevail.
Annexure- IV B (Pricing Document)				
83	Nil		1) For section including depots payment terms are to be given in 5 cost centre. They have given % for A & b cost center however no calculation criterion for constrains are mentioned for cost center C/D/E does it mean we can put % there without any constrain? If yes can we put balance 70% entirely in cost center C. Also on Pg no 136 they have mentioned if nothing is specified by bidder , the amount will be considered in last milestone D, however in this case last milestone in E and not D	Query is not releting to any specific clause. Kindly refer to Corrigendum/addendum, Item No 31

PART A Pre Bid Minutes

			2) For miscellaneous section , is the value under mis section is over and above “Section including depot”. If yes no clarity on cost centers under the same is given	Content of MIS section is clearly defined. Provision of clause is self explanatory
84	Annx 1		Whether this over rides the section 14 in GC	Overriding priority are indicated in Clause 1.of Section IX (PC Part A) of Part III
			Need to understand the complete price sheet and how they are interlinked with each other	Details are clearly defined in Pricing document. Kindly refer to Corrigendum/addendum Item No 31
			Annexure 1, Appendix 1 BOQ	
			Whether this price should be linked to Appendix 1?	Bidder understanding is correct
		Whether the quantity details are provided based on the station/location	Minimum BOQ have been worked out on the basis of minimum quantity required at Station/location	
85	A	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ____” from the Engineer for:	What is this?	It means He need to take No-Objection from Engineer in Charge
86	B:	- Issue of Inspection Certificate on satisfactory completion of all Factory Tests / running- Marine Insurance - Documents for shipment to Indian Port - Transit insurance from Port in India to Depot Site in Nagpur for:	What is factory test here? What is running? Contractdiction between B7 and the main requirmnet in B	Kindly refer to Clause 9.2.8.1 .of Section VII A (General Specification) of Part II & relevant caluse under various chapter of Section VII B (Technical Specification)
		B1 List of Materials required and Delivery Schedule thereof. MILESTONE PAYMENT SCHEDULE SHOWING MONTHLY CASH FLOWS FOR THE CONTRACT	Product payment will be on delivery? And materials here are the complete set of materials required for the project?	Mile stone payment are stage wise payment as per key dates specified in Part B of Section IX (PC) Part III.
87	C	accessories for stations & OCC and Backup OCC C4 Delivery of hand portable radios 500 (five hundred) numbers and associated accessories at Contractor’s premises in Nagpur.	Pls confirm whether bidder need to supply 500 No's of Portable hand sets as per the pricing document	Qty modified, Kindly refer to Corrigendum/Addendum Item No 31
		Indigenous Manufacture and Delivery: Receipt /delivery of following equipment after type test, factory acceptance test, and proof of insurance:	Whether the tesst mentioned here is the test for accepting the delivery or after installation and further work?	Type test & FAT are to be done before delivery of material
		DLP Support. - * This excludes Contractor’s obligations and responsibilities during the Defects Liability Period.	What is this whether this is the cost for 24 months DLP post go-live, please confirm, what is the meaning of excluding contractor's obligation	Ambiguity corected, Kindly refer to Corrigendum/Addendum Item No 31
APPENDIX 1: BILL OF QUANTITIES FOR NITL01/2016..				
88		BILL OF QUANTITIES FOR NITL01/2016 (THIS DOCUMENT IS TO BE PREPARED AND COMPLETED BY THE BIDDER) (Bill of Quantities to be proposed by Bidder along with the cost therein)	Whether this is the total supply cost for Cost center C? And the total of this has to match with which cost center cost	Cost center C under (SECTION INCLUDING DEPOT) covers cost associated with manufacture & delivery of material. Total cost will be reflected in Bid total for Cost center C under (SECTION INCLUDING DEPOT)
89	note 2	The BOQ indicated is the indicative BOQ and any additional items or enhancement of any quantity to complete the scope of work shall be borne by the NITL01 Contractor.	We request to include as below. Variation of any items in BOQ during execution, provided the change in Quantities is within ±10% shall be borne by the contractor. Any change is quantity above this limit shall be applied at the unit rate quoted by the Tenderer. Kindly confirm	Bidder request declined. Provision of tender clause will prevail.
			Request for change in payment term - All products supplied should be payable on delivery and all services will be with milestone basis and the monthly cash flow will be arriverd based on that.	Bidder request declined. Provision of tender clause will prevail. Kindly refer to Corrigendum/Addendum Item No 31
90			The price is in over all level. What will be the implication of site not ready?	Kindly refer to Clause 3.of Section IX (PC Part a) of Part III
1. BOQ of FOTS				
91	Sr No 1	1. Layer 3 switches Qty 79 in Minimum BoQ Document	Please share the type of switches (normal or industrial) with port numbers.	Details given in BOQ. Kindly refer to Corrigendum/Addendum Item No 31
2. BoQ of CCTV				
92	SN7		NVR qty mentioned in only 56 for 36 stations + 2 depots = total locations. Pl. clarify the quantification and consideration?	Mimimum quantity as per estimation of NMRCL given in BOQ. Bidder has to quote the qty as per his desgin complying with TS requirement.Kindly refer to Corrigendum/Addendum Item No 31
3. BOQ of Telephone				
93	SN5	Direct Line Telephones - 10 line in the Station/ depot/ Headquater area (other Than the SCR)	(1) Kindly provide the minimum qty. for the same as it is mention LumpSum. As per our calculation it is coming 344 nos., we request you to kindly amend the same in BOQ.	Minimum BOQ included, Kindly refer to Corrigendum/Addendum Item No 31
			(2)We request you to kindly provide the minimum qty. for the same as it is currently mentioned as LumpSum	
94	SN6	Direct Line Telephone Console at OCC 90 Lines capacity	Qty mentioned in bid format is 25 nos. whereas as per calculation the qty comes is 15 nos., as per PART II - works requirement (technical specifications) APPENDIX -H MMI provision Schdule at page no. 531, 532, 533, 534.	
			Please confirm how many control positions are there? 25 is mentioned but sometimes each controller has more than 1 line.	
95	SN7	Direct Line Master Conference Set	Qty mentioned is 25 nos. whereas as per Direct Line console requirement, it is 15 nos.	

PART A Pre Bid Minutes

96	SN8	Basic Phone	Qty mentioned in bid format is 900 nos. whereas as per calculation it is 1222 nos. under, document PART II, Section VII-B, Technical Specifications chapter -7, page no. 302 clause ref. no. 7.5.1.1.2, table no. 5.1 sl. no. 3	
97	SN9	Digital Feature Phone	Qty mentioned is 46 nos. whereas as per, document PART II, Section VII-B, Technical Specifications chapter -7, page no. 302 clause ref. no. 7.5.1.1.2, table no. 5.1 sl. no. 4, required quantity is 352 nos.	
4. BOQ for TETRA				
98		General	We understand that the quantities of TETRA Radios defined in the contract are fixed from Annex A, Chapter 6, TS. Please confirm.	Details given in Minimum BOQ. Kindly refer to corrigendum/addendum item No 31
99	SN9	CCTV BoQ-Industrial grade switches.	Please provide the number of industrial grade switches required for CCTV part as the line item for industrial grade switches with its quantity is not mentioned in the BoQ.	Scope of supply of switch for CCTV shifted in the scope of FOTS. Mimimum quantity given in BOQ. Kindly refer to Corrigendum/Addendum Item No 31
100	SN10		Quantities of 16port & 4 port industrial grade switch is not clear in BOQ shared by you. Quantities are only provided for spares. We need the exact overall quantities required for this project.	Mimimum quantity given in BOQ. Kindly refer to Corrigendum/Addendum Item No 31
Annexures				
101	2 (1)	The monthly cash flows shall be worked out as per the methodology indicated in relevant format under Section IV: Bidding Forms.	Which is the format to be used to arrive at the monthly monthly cashflow	Kindly refer to Clause 12 (Methodology for Working Out the Monthly Cash Flows) of Section IV (Bidding form) of Part 1
102	5 (1.1)	i) The unit rates and the lump sum rates (for those items where unit rates are not available) of Appendix 1 - BOQ for Main Line shall remain firm for the additional section(s)	This is not acceptable, hence the same has to be decided during the addition of new item. Or, we will accept the cap of 10% on given quantity, please change accordingly	Bidder request declined. Provision of tender clause will prevail. However Bidder may quote unit rate for the items to get payment for additional quantity
103	5 (1.2)	i) The unit rates and the lump sum rates (for those items where unit rates are not available) of Appendix 1 - BOQ for station/depot shall remain firm.	This is not acceptable, hence the same has to be decided during the addition of new item. Or, we will accept the cap of 10% on given quantity, please change accordingly	Bidder request declined. Provision of tender clause will prevail. However Bidder may quote unit rate for the items to get payment for additional quantity
104	5 (1.3)	i) The unit rates and the lump sum rates (for those items where unit rates are not available) of Appendix 1 - BOQ for Trains shall remain firm.	This is not acceptable, hence the same has to be decided during the addition of new item. Or, we will accept the cap of 10% on given quantity, please change accordingly	Bidder request declined. Provision of tender clause will prevail. However Bidder may quote unit rate for the items to get payment for additional quantity
105	5 (1.4)	1.4. In the case of 1.1 (additional section) & 1.2 (extension or new station/depot) above, a reduction of 20% shall be applied on Schedule J2 i.e. Project Management & Design for the extended stations / metro corridor. 1.5. In case of 1.3 (additional on board equipment) Schedule J2 items related Project Management and Design shall be taken as NIL.	Why this has been provided. Need to understand the reason for considering J2 at reduced value or nil. This is not acceptable, we will have cost impact	It is clarified that for additional qty rate will be 20% less of the quoted rate. Kindly refer to Corrigendum/Addendum Item No 31
106	Annexure-5 (2)	2. Pricing Mechanism for order after the last ROD	Not understood	It means for additional qty ordered after Revenue operation date (ROD) of last section,
107	4.3(13)	The Bidder's attention is drawn to the Key dates specified in Section IX. Particular Conditions Part A – Contract Data 'Table: Summary of Sections' . The Bidder shall prepare logic diagrams providing the philosophy for interface with other designated contractors & availability of track, electrification and signaling system to be available and submitted as part of its Bid. These logic diagrams shall be developed and submitted along with the Works Programmes as submitted during the course of the Works.		Kindly refer to Corrigendum/Addendum Item No 32
4.4 (Annexure IV C) Technical submission)				
108	4.2	Not Complied: Where the Bidder is not able to comply fully with certain clauses or has any observation or proposes an alternative design, "Not Complied" shall be indicated and comments if any of the Bidder shall be indicated in detail. All Clauses with status as "Not Complied" shall be included in the statement of Deviations (Section IV: Bidding Forms (Form 4.12)) and shall be priced in Annexure-4 of Pricing Document (Part 1B) .		Kindly refer to Corrigendum/Addendum Item No 33

PART A Pre Bid Minutes

109	4.3	<ul style="list-style-type: none"> Any comment by the Bidder in the Clause-by-Clause Commentary, other than either of “Complied”, “Noted” or “Not Complied” shall be treated as “Not Complied”. Unless Bidder prices against such clauses in the Annexure-4 of Pricing Document (Part 1B), the comment shall be considered as unconditionally withdrawn with no financial implications and shall be considered as NULL and VOID. Any “Not Complied” comment by the Bidder in the Clause-by-Clause Commentary which has not been included in the Statement of Deviations (Section IV: Bidding Forms (Form 4.12)) shall be treated as “Complied” with no financial implications. Any “Not Complied” comment by the Bidder in the Clause By Clause Commentary, which has also been included in the Statement of Deviations (Section IV: Bidding Forms (Form 4.12)) but has not been priced in Annexure-4 of Pricing Document Part 1B) shall be treated as null and void and deemed to have been unconditionally withdrawn with no financial implications. In case price for unqualified withdrawal of any remark, comment, condition, qualification or deviation etc. indicated in Statement of Deviations ('A', 'B' and 'C') (Section IV: Bidding Forms (Form 4.12)) is not quoted in Annexure-4 of Pricing Document (Part 1B), it shall be considered that the remark, comment, condition, qualification or deviation is unconditionally withdrawn without any financial implication. However, Employer at its sole discretion and option may assess the financial implication of the said remark, comment, condition, qualification or deviation etc. based on best engineering principles and concepts, which shall be 		Kindly refer to Corrigendum/Addendum Item No 34
110	4.4 A1	The Tenderer shall submit a detailed clause-by-clause commentary on all the clauses of the Employer’s Requirements. Where a clause merely provides	Please provide certificate of compliance format as mentioned	Kindly refer to Corrigendum/Addendum Item No 35
111	4.4 A9	The Tenderer shall also submit the existing/ proposed maintenance facilities in India for subsystems/ items as given in the Appendix B to Annexure 3 of	Please provide Annexure 3 as it is missing.	Kindly refer to Corrigendum/Addendum Item No 36
112	4.4 A 10	<p>a) Details of project staff – Appendix A to Annexure-3 of Initial Filter Questionnaire</p> <p>b) Technical Information of equipment proposed by the Tenderer. The Tenderer shall also submit a summary in the format given in Appendix B to Annexure 3 of Instructions to Tenderers.</p> <p>c) Information for justifying the provenness of the equipment proposed by the Tenderer in the format given in Appendix C to Annexure 3 of Instructions to Tenderers.</p> <p>d) Information for In-house or the sub-contract of design and manufacture or vending proposed by the Tenderer in the format given in Appendix D/E to Annexure 3 of Instructions to Tenderer s Proposed Supplier, Country(s) and technology adopted.</p>	There is no format for Appendix A to E. Request you to provide the same	Kindly refer to Corrigendum/Addendum Item No 37
113	4.12	We hereby confirm that all implicit and explicit deviations, comments and remarks mentioned in this ‘Form 4.12 Statement of Deviations’ but are not priced in Annexure-4 of Pricing Document (Form 3; Part 1B) (to be included with mention of price in Column D & E in financial package only) for its unqualified withdrawal, shall be treated as NULL and VOID and stand withdrawn.		Kindly refer addendum/corrigendum, item no 38
114	4.12 D	We hereby confirm that all implicit and explicit deviations, comments and remarks mentioned in ‘Form 4.12 Statement of Deviations’ but are not priced in Annexure-4 of Pricing Document (Form 3; Part 1B) for its unqualified withdrawal, shall be treated as NULL and VOID and stand withdrawn.		Kindly refer addendum/corrigendum, item no 39

PART A Pre Bid Minutes

115	8 Form	It is agreed by all the Members that there shall be separate Consortium Bank Account (distinct from the bank accounts of the individual Members) to which the individual Members shall contribute their share capital and/or working capital and the financial obligations of the Consortium shall be discharged through the said Consortium Bank Account only and also all the payments received by the Consortium from the Employer shall be through that account alone	Please note that Consortium works on the divisible scope of work having a lead partner with joint and severally liability and having separate bank accounts for individual consortium members, therefore a separate bank account for consortium is not required.	Bidder request declined. Provision of tender clause will prevail.
116	9 Form	(B) Format for the Board resolution to be passed by Lead Member of Consortium (applicable in case the Bidder is a consortium) (C) Format for the Board resolution to be passed by a Member other than the Lead Member of Consortium (applicable in case the Bidder is a consortium)	In mentioned section B and C of Form 9 Bidding forms there is a requirement to provide specific board resolutions for 'Design, Manufacture, Supply, Installation, Testing and Commissioning of Signalling and Train Control System' for Nagpur Metro Rail Project. We understand that Power of Attorney given to the authorized signatories by the Managing Director who is empowered to sub delegate the power under general board resolution, will be valid and hold good for the signing and execution of the Bid documents and contract agreement. Please clarify whether the assumption drawn above is sufficient to satisfy the conditions laid under Point B and C. of Form 9.	Bidders request accepted. Kindly refer to Corrigendum/Addendum 3, Item No 2
117	10 Index	The Bidder shall include with its Bid an index which cross refers all of the Employer's bidding requirements elaborated in these documents to all the individual sections within Package 1: Technical Package and Package 2: Financial Package which the Bidder intends to be the responses to each and every one of those requirements. The Packages submitted must be clearly presented, all pages numbered and laid out in a logical sequence with main and subheadings to facilitate evaluation.	-	Kindly refer addendum/corrigendum, item no 40
118	12	Methodology for Working Out the Monthly Cash Flows	Want to understand whether the payment per month will be based on the milestones mentioned in each cost center in Annexure 4 What will be the payment terms for cash flow arrived at with Appendix 1 milestones. Not able to link this to GC. As Part 1 overrides GC 14 please link tis to Appendix. However all payment for the month for the completed milestones with the required duocument should be released with in 20days from the end of the month.	Clause is self explanatory Bidder request declined. Provision of tender clause will prevail.
119	12 (8)	20% (Twenty Percentage) of the Accepted Contract Amount payable in two instalments - 10% (ten percent) in first instalment and 10% (ten percent) in second instalment - in the currencies and proportions in which the Accepted Contract Amount is payable. PC Part A:Contract Data – Item 38 Part-1, Section V (Eligibility Criteria): Methodology for Working Out the Monthly Cash FlowsSn. 8. Amount of Advance Payment: 15% (interest free) of the Total Contract Price in the respective currencies in two installments as detailed in PC.	The amount of interest free mobilization advance as mentioned in Part III Section X – Contract Forms – Item-38 is 20% of accepted contract value whereas that provided in Part I Section IV (Bidding Forms) is 15% of accepted contract value. Bidder requests to clarify as to what will be the exact percentage of mobilization advance provided to the successful bidder. Here in this clause the amount of advance payment is indicated as 15% whereas in other sections it is indicated as 20%. Pl confirm if the amount of advance payment shall be 20% payable in 2 installments as indicated in Clause 14.2, Advance Payment.	Kindly refer addendum/corrigendum, item no 41
120	12 (10)	Advance is paid in two tranches – first and second tranche are 10% and 5% respectively of total Contract Price in respective currencies.	Sub Clause 14.2 : Total Advance Payment 20% (Twenty Percentage) of the Accepted Contract Amount payable in two installments - 10% (ten percent) in first installment and 10% (ten percent) in second installment - in the currencies and proportions in which the Accepted Contract Amount is payable.	Kindly refer addendum/corrigendum, item no 42

PART A Pre Bid Minutes

121	12 (12)	To be added to Milestones as quoted by the Bidder in Annexure-4 (Pricing Document, Part 1B). In case the cost center & milestone no. is not specified by the Bidder, this amount to be considered with the last milestone under Cost Centre 'D'. The FC to be rounded off to Zero decimal places and the LC rounded off to Rupee as per PC 56. In case, the aggregate distributed amount is not equal to the Price of withdrawal of the condition, adjustment to be done in the earliest Milestone to which the price has been distributed.	-	Kindly refer addendum/corrigendum, item no 43
122	Form		Please provide the Manufacturer's Authorization Format	Kindly refer addendum/corrigendum, item no 44
Part II Section VII-A General Specifications				
123	1.14	New Clause added	-	Kindly refer to Corrigendum/Addendum Item No 45
124	3.4.6 g (xv)	DLP Defects Liability Period (DLP)	How many years/ Months for the defect liability period? Is there any separate requirement for the no of years/ Months for the defect liability period as well as warranty for equipments and spares. Kindly clarify	Please refer Part III General Conditions of Contract: Contract Data Point No. 6 - Defects Liability Period is 24 months from the date of issue of Taking Over Certificate for work or section/sections.
125	7.4.2.2	All multi-core cables shall allow 20% or 2 cores, whichever is the greater, as spares as specified in the PS.	Please confirm that this requirement is not applicable for Power cables.	Bidders understanding is correct
126	8.7	New Clause added	-	Kindly refer to Corrigendum/Addendum Item No 46
127	9.4.5.1	System Acceptance Tests are defined as the tests undertaken to demonstrate that the Works in its entirety is capable of functioning in accordance with the specified requirements in the Contract in all respects.	-	Kindly refer to Corrigendum/Addendum Item No 47
128	10.2.1	Training shall consist of classroom (theory) training, computer based interactive multi-media training (CBT), simulator training (if applicable), and practical (hands on) training.	Please exclude the CBT training method requirement as this method is not applicable for telecom subsystems training.	Bidder request declined. Provision of tender clause will prevail.
PART II, Section VII-B, Works Requirements Technical Specifications Chapter 1 (General Requirements)				
129	Nil	PS - Particular Specification	-	Kindly refer to corrigendum/addendum item No 48
130	NIL	Chapter I section VII B	Please share the indicative list of documents	Kindly refer to Corrigendum/Addendum, Item No 49
131	1.1.1.3	The Technical Specification is divided into Nine chapters:	-	Kindly refer to corrigendum/addendum item No 50
132	1.1.3.1	Employer's drawings consist of Part II: Section VII C – Schedule of Dimensions: Reference Documents / Drawings includes Reference Drawings for typical stations, Depot layout plans and OCC. All drawings are conceptual design drawings and details shown on the drawings are for information only. The accuracy of preliminary details shown on the drawings can't be guaranteed and should be treated accordingly.	Please provide Part II: Section VII C- Schedule of Dimensions including Reference drawings. A) We would request a Detailed Drawing for a Sample Platform detailing the locations of the various Offices v.i.z Station Room, Station Security control room, Platform supervisory booths, TER/CER B) Detailed Drawings for the OCC, BCC, Intergange station, RSS, Depot & Admin Bldg. C) Is there any Sample platform station that is ready and which can be considered as a reference to carry out sample site survey?	Kindly refer to corrigendum/addendum item No 51, typical drawings are enclosed in Part II, Section VIIC.
133	1.1.4.1	The Sub-system and its constituent parts shall comply with the relevant latest version of British Standards, International Electromechanical Commission (IEC) standards, International Organization for Specification (ISO) Standards, European Standard (EN) or UL Standards (Underwriters Laboratory) etc. as specified	-	Kindly refer to corrigendum/addendum item No 52
134	1.1.5(1)	(For efficient Metro railway management and operation, it is essential to have a well organized telecommunication network covering strategic locations like OCC, passenger stations, depot, and it is equally essential to have reliable links between the strategic locations and moving trains or working staff along the railway track/Tunnel.	We understand that the entire corridor is elevated and there are no tunnels. Kindly confirm.	Bidders understanding is correct. Kindly refer to corrigendum/addendum item No 53
135	1.1.5(2)	The FOTS and Wide Area Network being provided under FOTS Sub-system of Contract NITL01 shall provide all necessary communication channels for carrying voice, data, and video signals for Metro railway management and operation from Station/Depot TER to OCC CER. The Transmission Backbone is to be used for Communication Based Train Control system.	-	Kindly refer to corrigendum/addendum item No 54

PART A Pre Bid Minutes

136	1.1.5(9)	A CCTV station surveillance system shall be built through CCTV sub-system of N1TL01 contract for supervising strategic operational locations like Station car park, AFC gates, ticketing offices and lobby, escalator, Lifts and staircase exits and platform operational area and PF ends to ensure safe operation of the Metro and security locations at stations.	1. Please provide the details of stations which have car park for BoQ estimation.	(1) One parking per station (except interchange station, where 2 parking) may be considered. Kindly refer to corrigendum/addendum item No 74, typical drawings are enclosed in Part II Section VII C.
137	1.1.5(11)	48 V DC Power Supply System for Powering the Telephone System and also for Powering all other Telecomm Systems such as Radio, Fibre Optic Transmission (FOT) Systems, Clock, etc shall be designed, installed, commissioned, tested and maintained as part of the scope of N1TL01 Contract.	-	Kindly refer to corrigendum/addendum item No 55
138	1.1.5(13)	New para: OA&IT System (Only LAN & Networking Hardware) at stations, RSS, Depot & OCC/BCC. Details provided under chapter 9 FOTS	-	Kindly refer to corrigendum/addendum item No 56
139	1.2	NOT USED	-	Kindly refer to corrigendum/addendum item No 57
140	1.3.3.2(2)	Design, Supply and Installation of Base Frame, False Floor & under False Floor Cable Trays with required risers for wall mounted units in TER of Stations/Depot and under false floor cable trays in SCR. List of Stations (The scope of N1TL01 Contractor) is given in Appendix C of this TS	-	Kindly refer to corrigendum/addendum item No 58
141	1.3.8	The N1TL01 Contractor shall be provided space to set up Project Office and Storage Space for both signalling and telecom segments. N1TL01 shall necessarily have to station at this Project Site Office throughout the contract period, the key personnel for design and implementation- co-ordination etc. and shall submit a list for the same to review.	-	Kindly refer to corrigendum/addendum item No 59
142	1.3.10	New para: furniture for telecom	-	Kindly refer to corrigendum/addendum item No60
143	1.4.1.2	The Systems shall be so designed as to have a minimum of 15 years of service life operating continuously for the equipments (excluding Servers & workstations) For Servers & workstations it shall be 10 years. The life of all the cables shall not be less than 25 years.	As per our understanding, the service life of servers and workstations is less and not 10 years. We suggest that keeping the current industry norms, to specify this as 5 years. Kindly advise.	Bidder request declined. Provision of tender clause will prevail.
144	1.4.4.12	The Contractor shall submit Maintainability Plan to the Employer's Representative for review in accordance with RAMS Plan.	-	Kindly refer to corrigendum/addendum item No 61
145	1.6.1.2.1	The Contractor shall submit detailed design calculations and supporting drawings, documents, etc., for the system to the Employer's Representative for review.	-	Kindly refer to corrigendum/addendum item No 62
146	1.6.2.1.6	New clause on industrial grade requirement	-	Kindly refer to corrigendum/addendum item No 63
147	1.6.3.2	Unless otherwise specified, all telecommunication equipment installed under this Contract inside rooms with controlled environment shall be designed for operation in temperatures of 0oC to + 40oC. All equipment installed outside these areas shall be rated for continuous operation up to + 55 deg C.	We note that the equipment room at Stations/OCC/DCC are all air conditioned. Most of the standard telecom equipments & servers from reputed OEMs support satisfactory performance specified at 32 degree C (max). We requested to amend the controlled environment range for equipments installed inside rooms accordingly.	Bidder request declined. Provision of tender clause will prevail.
148	1.6.3.4	All MMI's in the SCR/PCR/OCC Theatre shall be extended through Line Extenders from their respective Severs/PC's kept in the TERs.	Kindly advise what does PCR stands for?	PCR (Police Control room) or SCR (Security Control room). Somwe clauses it is refered as PCR and some it is refered as SCR both are same.
149	1.7.3	New Clause on interface matrix added	-	Kindly refer to corrigendum/addendum item No 64
150	1.8.1.1	The Contractor shall perform stage-wise testing and commissioning activities in accordance with the requirements given in this Specification. Order of priority of commissioning is 1. Priority Section by sept 2017 > 2. Reach-1 by June 2018 >3. Reach -3 by Oct 20118 >4. Reach 4 by Feb 2019 >5. Reach 2 by Nov 19.	-	Kindly refer to corrigendum/addendum item No 65
151	1.8.3.7	At least 5 samples from random supplies of each type of cables shall need to be got inspected by an Independent Govt Approved Lab in India by the Contractor at his own cost.	Please confirm that clause 1.1.6 of Appendix D for cables other than the RDSO/TEC certified cables will prevail on clause 1.8.3.7 and Clause 1.1.7 of Appendix-D.	Clause 1.8.3.7 will prevail. Ambiguity corrected, Kindly refer to Corrigendum/Addendum, Item No 259

PART A Pre Bid Minutes

152	APPENDIX 1.1.6	D: The Contractor shall satisfy the Employer's Representative by producing certificate from a recognized testing laboratory or otherwise that the materials used and the cable itself is of the highest possible standards and complies with all relevant specifications. In case of no relevant test certificates being available tests shall be carried out by the Contractor (manufacturer) as those laid down with relevant specification but this shall not preclude any test desired by the Employer's Representative to determine the quality of the cable. For Cables as per RDSO/TEC specifications, the Contractor shall have to get the cables inspected by RDSO /TEC and all cost therein has to be borne by the Contractor.		
153	APPENDIX 1.1.7	D: NMRCL choose four random samples for each type of cable and send it for Independent Testing from a Government approved testing Lab. The Contractor shall coordinate the testing and bear all the costs therein.		
154	1.8.4.1	The Contractor shall prepare and submit to the Employer's Representative for review an On-site Testing and Commissioning Plan.		Kindly refer to corrigendum/addendum item No 66
155	1.8.4.3.1 (5)	New Clause on method statement added		Kindly refer to corrigendum/addendum item No 67
156	1.8.4.6	Service Trials	Pls confirm the period of the Service Trials - for how long. When does it commences?	Service trail will commence after Integrated testing & Commissioning & will continue till Pre DLP RAMS demonstration.
157	1.10.1.13	New Clause on insatallation material added		Kindly refer to corrigendum/addendum item No 68
158	1.10.1.14	New Clause on structured cabling added		Kindly refer to corrigendum/addendum item No 69
159	1.10.4.6.4	At elevated sections HDPE Duct shall be installed in the ducts provided by Project Contractors.		Kindly refer to corrigendum/addendum item No70
160	1.10.6.4	Labels and notices on equipment shall be fixed with roundhead brass screws or self tapping screws. Stick-on labels or fixing by adhesive shall not be accepted	Please confirm if this will be applicable for field equipments and cables. Pre fabricated racks like MSO, MTS 4 has its own labelling by OEM for identifications and cannot be altered.	Bidder request declined. Provision of tender clause will prevail.
161	1.10.7	3 Phase 415 V AC from the UPS, to meet the requirement of Telecom, AFC and Signalling Contract shall be provided by N1S01 Contractor in UPS (S&T) Room	We understand from the tender documents that the UPS scope is covered by N1S01 contract and is totally excluded from N1TL01 contract scope. Please confirm if our understanding is correct.	Bidders understanding is correct, Kindly refer to corrigendum/addendum item No 80
162	1.10.8.6 Appdx A2, 5 Appdx A6, 3	Main Earth (For Elevated Stations) & Clean Earth (For Elevated stations) 5. Provision of Earthing at stations in equipment rooms. 3. Provision of Earthing at equipment rooms in Depot Control Centre building.	With reference to Clause 1.10.8.6 We understand that Main earth and Clean earth bus bar shall be provided in TER, CER , SCR and Depot Control Room by E&M contractor. Please confirm and Ammend the N1TL01 contractor's scope as mentioned in Appendix-	Explanation given in 1.10.8.6 is self explanatory, Main and Clean earth bus bar in the mentioned shall be extended by E&M Contrator. Kindly refer to Corrigendum/Addendum , Item No259
163	1.10.8.10	The metallic sheath and armouring of all cables shall require earthing with Earth in Elevated/At Grade and Underground Sections.	We understand that the entire corridor is elevated and there is no underground section. Kindly confirm.	Bidders understanding is correct
164	1.10.10.1	All equipment installed shall be able to withstand vibration levels likely to be experienced in railway stations, tunnels and structures.	We understand that the entire corridor is elevated and there are no tunnels. Kindly confirm. Please provide if there is any relevant specification to be followed for the vibration standard.	(1) Bidders understanding is correct (2) Contractor needs to desgin the system complying the clause.
165	1.11.5.1.1	Support during Defects Liability Period	Kindly confirm the duration of the DLP period and when does it commence? There is also no mention of supervised maintenance. Pls advise.	(1) Kindly Refer to Part III Section VII General Conditions of Contract (Contract Data Sr No. 6) which is Self Explanatory (2) Kindly refer to Corrigendum/Addendum , Item No 72
166	1.11.5.1.4	DLP shall be on section-by-section basis as detailed in the PC.** The Contractor shall submit a maintenance manpower plan showing the Contractor's organization and committed resources level available for all types of activities to be carried out within the Defects Liability Period.	1. We understand the DLP period as two years , please confirm. 2. Please provide the Particular Contract(PC) document of tender.	Kindly refer to Part III Section IX (PC) PART-B Table: Summary of Sections (KEY DATES)

PART A Pre Bid Minutes

167	1.17	Proof of Concept: Tenderer are requested to demonstrate a POC (Proof of Concept) for FOTS and Radio system before commencing detailed design. The vendor shall set-up a prototype test set up to demonstrate major functionalities as specified in TS including Redundancy levels, Traffic analysis, Convergence Time, Latency, Synchronization, Interfaces & Integration etc.	PoC for the radio system covering all interfaces and integration shall be very limited as it requires intervention of Rolling Stock and signalling contractor as well. Kindly advise.	Bidder request declined. Kindly refer to corrigendum/addendum item No 73
168	1.18	Integrated Test Facility: An integrated test facility to demonstrate the integration and functionalities of all COM Sub-system and its simulated interface with other system should be developed at test lab in our premises before actual commissioning of the systems. Suitable equipment, furniture, cables and accessories shall be scope of the COM contractor.	It is requested to include the tentative BoQ for Lab equipment for the estimation.	Tentative BOQ included in price schedule (Annexure IV B)
169	1.19	The purpose of integrated test facility is as follows:	We understand that for this facility , redundancy in all applicable systems is not required. Also we can use low end servers for various systems. Please confirm.	Equipment being installed at integrated test facility shall be of same configuration as provided for site.
170	annex 1	New Clause added	-	Kindly refer to corrigendum/addendum item No 74
PART II. Section VII-B, Works Requirements Technical Specifications Chapter 2 (PA system)				
171	2.1.2.2	The PAS shall have control equipment located at the equipment room(s) of each station, depot, OCC and NMRCL HQ.	As per Chapter 9 – FOTS, clause 9.1.3.4.5, NMRCL Headquarter Building will be in OCC or BCC. Kindly advise if we still need to provide separate control equipments for NMRCL HQ. If yes, kindly clarify the requirements of PAS equipment at HQ (quantity of announcement consoles, speakers etc).	Qty for NMRCL HQ included. For Minimum BOQ Kindly refer to Corrigendum/Addendum Item No 31
172	2.1.2.5(1)	(1) Platform supervisors booth (PSB)	-	Kindly refer to corrigendum/addendum item No 75
173	2.1.3	New Clause added	-	Kindly refer to corrigendum/addendum item No 76
174	2.2	New Clause added	-	Kindly refer to corrigendum/addendum item No 77
175	2.3.2. (1)	Integrated PAS control equipment	(1)Integrated PAS/PIDS control equipment should be written in place of Integrated PAS control equipmnet in all references of this document). (2)PAS/PIDS control equipment should be an integrated system for user's ease of operation and same is being used in other metros in India & worldwide, therefore this clause should be revised accordingly (Integrated PAS/PIDS control equipment should be written in place of Integrated PAS control equipmnet in all references of this document).	Kindly refer to Corrigendum/Addendum Item No 78
176	2.3.2.(4)	PAS/ PIDS integrated MMIs to be provided by PIDS Systems Supplier	PAS/PIDS integrated MMIs may be provided either by PAS system supplier or PIDS system supplier. Please rephrase as "to be provided by PIDS System Supplier" PAS/PIDS integrated MMIs may be provided either by PAS system supplier or PIDS system supplier. Therefore clause may be revised to delete part of the sentence "to be provided by PIDS System Supplier"	No need to change it is the responsibility of SI to provide the facility from PIDS or PAS OEM.
177	2.3.2. (8)	Microphones Wired & Wireless type	(1) Use of wireless type Microphones is not prevalent in metros. It may be revised to Wired Microphones. (2) Wireless type Microphones are not proven in Railway/ Metro environment & would require specific frequency spectrum for their protected operation. Only wired type Microphones are being used in other Metros. Therefore, wireless type Microphones may be deleted from the clause. (3)Specification of wired and wireless microphone is same as no other specification is mentioned in tender, Please confirm. OR Wireless type Microphones are not proven in Railway/ Metro environment & would require specific frequency spectrum for their protected operation. Only wired type Microphones are being used in other Metros. Therefore, wireless type Microphones may be deleted from the clause. (4) Specification of wired and wireless microphone is same as no other specification is mentioned in tender, Please confirm	(1)Wireless microphone required For specification , Kindly refer to Corrigendum/Addendum Item No 97
178	2.3.2(22)	New Clause added	-	Kindly refer to corrigendum/addendum item No 79

PART A Pre Bid Minutes

179	2.3.3.2.	NITL01 will be required to provide a PIDS server to interface to the ATS system.	PIDS server to be changed with Integrated PAS/PIDS server as per remarks against clause 2.3.2 above.	Kindly refer to Corrigendum/Addendum Item No 80
		One hard wired PA Control panel, complete with microphone and zone selections shall be provided in OCC, and SCR of each station for announcement in the station area so that, in case of emergency, announcement can be done in each zone / all zones. One Wireless Microphone shall be provided at every station, docking type Power Charger for Wirless Microphone shall be located at PSB. Proper Antenna shall be provided to for Wireless Microophone so that it will have coverage /range in entire Platform Area.	Wireless type Microphones may be deleted from the clause as per remarks against clause 2.3.2(8) above	Bidder request declined. Provision of tender clause will prevail.
			Specification of wired and wireless microphone is same or different.Please confirm.	Kindly refer to Corrigendum/Addendum Item No 97
180	2.4.1.4	The PAS shall adopt a sound pressure level compatible with the stations architectural design and the associated acoustics with recessed type speakers for false ceiling areas and wall or surface mounted type speakers for non-false ceiling areas		Kindly refer to corrigendum/addendum item No 81
181	2.4.1.6 e	The Acoustic Consultancy shall submit a report, for approval of the Employer, on the STIPA performance of each site which shall inter-alia include the following:	_In place of STIPA report for each individual site, similar sites may be grouped together and one station from each group may be selected for STIPA report. The Acoustic contractor should be made responsible for submission of report for approval of the Employer. Therefore clause may be amended as below: The Acoustic contractor shall submit a report, for approval of the Employer, on the STIPA performance of each group of similar site which shall inter-alia include the following:	Kindly refer to corrigendum/addendum item No 82
			Material with proper Noice reduction coefficient, sound absorption co-efficient, good absorption quantity etc. must be used by civil sub-contractor inorder to achieve the RT values mentioned in 2.4.1.6 Table-2 Reverberation time targets. Please confirm compliance of this requirement from Civil sub-contractor.	The recomondation should be placed by the NITL01, this is in scope of contractors interface with civil contractor.
182	2.4.1.7.2.	The total harmonic distortion for the radio to PAS broadcast at full rated output shall not exceed 8%.	Radio system is third party equipment and Total Harmonic Distortion of Radio-to-PAS broadcast should be in the scope of Radio system supplier. However, for clarity, this clause may be amended as below: The total harmonic distortion of the PA system for the radio-to-PAS broadcast at full rated output shall not exceed 8%.	This is to be done by System Integrater as a part of over all scope. Technical requirement remains unchanged .
183	2.4.1.8.2.	The corresponding system frequency response from a radio input channel shall be 300 Hz to 3 kHz, ± 3 d B	In view of the above at 2.4.1.7.2, this clause may be amended as below: The corresponding system frequency response of the PAS for a radio input channel shall be 300 Hz to 3 kHz, ± 3 dB.	Technical requirement remains unchanged . Bidder to design and propose solution accordingly .
184	2.4.1.8.3.	The signal-to-noise ratio (SNR) of the PAS shall be better than 40 dB. For radio PA Broadcast, the SNR Shall be better than 30 dB.	Similarly, SNR for Radio PA broadcast may be removed as below: The signal-to-noise ratio (SNR) of the PAS shall be better than 40 dB.	Technical requirement remains unchanged . Bidder to design and propose solution accordingly .
185	2.4.1.9.1	The processing and switching delay contributed by the PAS equipment shall not exceed 250 ms for any type of commands.		Kindly refer to corrigendum/addendum item No 83
186	2.4.1.10.1	All the loudspeakers shall be able to withstand operation at its rated noise power for 100 hours in accordance with IEC268-5 Power Handling Capacity standards.	Such information is usually not available in the data sheets. Kindly advise how this requirement will be validated.	If information is not available in data sheet, OEM certificate/3rd Party lab test report may be enclosed.
187	2.4.1.10.3	The loudspeakers shall be capable of operating safely within an ambient temperature range suitable for the city.		Kindly refer to corrigendum/addendum item No 84
188	2.4.1.10.4	All Loudspeakers shall be EN54-24 or UL Approved by 3rd Party Laboratory. Certificate of approval shall be submitted by Bidder.	(1) EVAC approval may also be added as an option for certification of Loudspeakers. (2) EVAC approval may also be added as an option for certification of Loudspeakers. Relevant certificates/ approvals may be asked at the time of proof of concept (POC) of the system, not required at the stage of bidding.	Bidder request declined. Provision of tender clause will prevail.
189	2.4.1.10.5.	Loudspeakers shall be of same make/OEM as that of Control & Amplifier make/OEM. Loudspeakers with different brand & Electronics i.e. Amplifiers & Matrix of different brand will not be accepted.	(1) This requirement may lead to monopoly of the OEM. Request you to give flexibility to choose different OEM for speakers, amplifiers and all other equipments of PAS system which shall meet all contractual requirements. (2) OEMs of Loudspeakers & PA system/ Amplifiers/ Audio Matrix may be different. Loudspeaker is one of the components in large PA system only and linking same OEM of loudspeaker with PA system will limit the no. of OEMs. Therefore this clause may be deleted.	Bidder request declined. Provision of tender clause will prevail.
190	2.4.2.2	Digital voice announcer equipment > 50,000	35000	Bidder request declined. Provision of tender clause will prevail.

PART A Pre Bid Minutes

191	2.4.3.1.	Any equipment without field failure data shall have its failure rate determined strictly in accordance with MIL HBK- 217F for its appropriate operating	As per clause MIL-HBK-217F military standard is required. As metro requirement it should be BS & EN standard and EVAC complied system. Please clarify.	Bidder request declined. Provision of tender clause will prevail.
192	2.4.3.2	PAS announcement initiated by any mode of operation shall be considered unavailable under the following failure conditions as a minimum	-	Kindly refer to corrigendum/addendum item No 85
193	2.4.3.5.	The Radio-to-PAS announcement shall have an availability of better than 99.9%	In view of the above at 2.4.1.7.2, this clause may be amended as below: The Radio-to-PAS announcement shall have an availability of better than 99.9%, in case of availability of Radio signal.	This is to be done by SI as a part of over all scope. Bidder request declined. Provision of tender clause will prevail.
194	2.4.3.6.	The PAS shall have two Racks/ Amplification systems as each station as primary & secondary, the primary rack will feed to Even No. speakers of all zones & secondary rack will feed to Odd numbered speakers of all zones. Failure of Primary Rack shall not hamper functionality of secondary rack hence maintaining 50% speakers availability.	(1)This functionality is possible with one Rack/ Amplification system also by dedicating separate amplifiers for odd & even no. of loudspeakers. Therefore this clause may be deleted. (2)This functionality is possible with one Rack/ Amplification system also by dedicating separate amplifiers for odd & even no. of loudspeakers. Therefore requirement of separate racks may be deleted	Bidder request declined. Provision of tender clause will prevail.
195	2.4.4.2	The service life of the PAS shall not be less than 15 years excluding Workstations/Servers. The service life of all types of cables shall not be less than 25 years and for Workstation/Servers the service life is 10 years The service life shall be counted from the commencement date of Defect Liability Period.	As per our understanding, the service life of servers and workstations is very less and not 10 years. We suggest that keeping the current industry norms, to specify this as 5 years. Kindly advise.	Bidder request declined. Provision of tender clause will prevail.
196	2.4.4.3	Manufacturer of PA system products should have office & service support center in India.	presence in Indian in terms if service and support .. What are the evidence proof to have service and support in India	Bidder to submit support letter and credential from OEM accordingly.
197	2.4.5.1	The output of the PAS amplifier should be tapped and recorded automatically.	Taped for each amplifier or by zone (several amplifiers) ?	Each Amplifier to be tapped.
198	2.4.5.2	All equipment must comply with and be installed in accordance with IEC 65, IEC 364 and to current safety standards applicable in India.	-	Kindly refer to corrigendum/addendum item No 86
199	2.5.1.3.	PAS announcement shall be capable of being originated from designated hand portable radio also to a set of pre-defined PAS zones at each station. It should be possible to make simultaneously Radio to PAS announcement at minimum 5 different stations. This needs to be planned, executed and demonstrated by N1TL01 contractor.	This clause may not be relevant to functionality of PAS as Radio signal is not directly connected to PAS equipment. Radio is interfaced through Telephone equipment which is a dedicated channel for PAS system. Therefore, this clause may be revised accordingly.	This is to be done by SI as a part of over all scope. Bidder request declined. Provision of tender clause will prevail.
200	2.5.1.4	The PAS shall have the necessary facilities to enable up to 3 different messages to be simultaneously broadcast over different zones or group of zones in the station.	Generally announcement of 2 different audio messages simultaneously is required in such type of applications, one audio for UP Platform & another audio message for DN platform. Therefore clause may be revised to change to 2 different audio message.	Bidder request declined.
201	2.5.1.8	The PAS at each site shall interface locally with Fire Alarm System for initiation and broadcast of fire alarms (voice alarms)	As we understad this requirement is detailed in TS clause 2.7.9. Please confirm.	Bidders understanding is correct
202	2.5.2.1(2)	Automatic mode based on information from the TC&S System for train related information broadcast.	-	Kindly refer to corrigendum/addendum item No 87
203	2.5.3.1(5)	All Common area in between Property Development and Station area used for passenger movement.	We understand that no speakers' needs to be installed at areas mentioned as property development in the architectural drawings once made available to us. Kindly confirm if our understanding is correct.	Bidders understanding is correct. Provision of clause is self explanatory
204	2.5.3.2.3	Please note, stations will have two platforms each. Additional PAS zones shall have to be planned and provided at such stations.	(1) Please specify the stations requiring additional PAS zones. (2) Second part of the clause is not relevant as there are only 2 platforms per station, therefore may be deleted.	Apart from platforms , additional PA Zones to be planned for paid- unpaid concourse area , entry -exit of the station ,technical rooms etc. Contractor shall design and propose technical solution for additional zone also accordingly .
205	2.5.3.3.1	The contractor shall develop full details of the PAS zone assignment for full coverage of workshops, servicing shed(s) and covered stabling lines and submit to the employer's representative for review.	-	Kindly refer to corrigendum/addendum item No 88
206	2.5.4.1.5	Each PSB shall be provided with a wireless microphone	Wireless microphone may be changed to wired microphone as explained under clause 2.3.2 (8) above.	Bidder request declined. Kindly refer to corrigendum/addendum item No 89
207	2.5.4.2.1	The OCC & BCC shall have full announcement facilities as described for the SCR MMI and shall also be provided with the necessary facilities to access every station.	OCC shall make different simultaneous announcements to all the stations	

PART A Pre Bid Minutes

208	2.5.4.2.2.	Multi drop data links (TCP/IP) of adequate bandwidth through FOTS shall be provided to each station PAS allowing the OCC to broadcast messages to the following as a minimum:	Multi-drop data links (TCP/IP) of adequate bandwidth through FOTS shall be provided by FOTS contractor to each station PAS allowing the OCC to broadcast messages to the following as a minimum:	This is to be done by SI as a part of over all scope. Kindly refer to corrigendum/addendum item No90
209	2.5.4.4.1	On detection of fire alarm, operator in SCR / PSB shall manually make live announcements to alert the passengers and staff and broadcast evacuation messages	_	Kindly refer to corrigendum/addendum item No 91
210	2.5.6.5.	Live audio broadcast relating to emergency, fire and evacuation messages from OCC shall be recorded in the Centralized digital recording system at OCC. Similar broadcasts made from SCR/PSB shall be recorded at the SCR/TER in the PAS station server or the MMI itself. It shall however be possible to retrieve any message so recorded and save same on an external storage device like a memory stick for future reference.	(1)We understand from this clause that only live audio broadcast from OCC shall be recorded in Centralized digital recording system at OCC. Live audio broadcast from SCR/PSB shall be recorded at the SCR/TER in the PAS station server or the MMI itself and will not be stored in Centralized digital recording system at OCC. Kindly confirm.	(1)Yes , understanding is correct
			(2) Recording of all emergency announcemets from OCC to be done centrally and it wouldn't be done locally in MMI for station, as no server is required on station as per BOQ. Please confirm	(2) The functional requirement is clearly defined . Station shall be having servers . Please propose technical solution accordingly .
			(3) Bidder assume that Local broad casting from SCR/ TER shall be locall recorded at respective station MMI's, Please confirm	(3)Yes , understanding is correct
211	2.5.8.2.	The performance of the PAS shall be maintained at its uncompensated level in the event of a total failure of the noise sensing device.	In the event of failure of noise sensing device, PAS shall be maintained at its uncompensated level which shall be predefined. Therefore, clause may be amended as below: The performance of the PAS shall be maintained at its predefined uncompensated level in the event of a total failure of the noise sensing device.	Bidder request declined. Provision of tender clause will prevail.
212	2.5.10.1.1.11	Each MMI shall be equipped by a PAS control panel to enable live announcement to be made even when the MMI and DVA fail	In case of MMI and DVA failure, zone selection are predefined or need to be individually address in each station ?	Selection of Zone from PAS Control Panel should be configurable individually at each station .
213	2.5.10.1.1.14	The SCR MMI shall receive notification of any message initiated from the microphone broadcast from the PSB.	_	Kindly refer to corrigendum/addendum item No 92
214	2.5.10.1.1.17.	The PAS MMI at OCC should be minumim 20" Touchscreen & PAS MMI at SCR should be minimum 5" touchscreen	(1)Touch screen based MMIs are not proven in Rigged Railway/ Metro envoronment. Therefore normal MMI with standard keyboard may be incorporated in place of touch screen.	Kindly refer to Corrigendum/Addendum , Item No 93
			(2)As per PS touch screen MMI is required ,To optimised hardware can we provide all in one workstation.Please confirm	
			(3)Touch screen based MMIs are not proven in Rigged Railway/ Metro environment. Therefore normal MMI with standard keyboard may be incorporated in place of touch screen. In case Touch Screen is Mandate Requirement, propose to have All in One PC	
215	2.5.10.1.1.20	The MMI at SCR should have capabily to Label/ Name the Buttons in software as per customised requirements of NMRCL.	This requirement is not clear. Kindly clarify.	It is clarified that the MMI at SCR should have capability to label/rename icons/zones/location as per customized requirement of NMRCL
216	2.5.10.2	For OCC, N1TL01 contractor shall provide Backup MMI. No Backup MMI is foreseen and required at stations. It is envisaged that with a single MMI,	_	Kindly refer to corrigendum/addendum item No 94
217	2.5.10.4	Platform Supervisors Booth (PSB)	Wireless type microphone may be deleted from all the sub clauses.	Bidder request declined. Provision of tender clause will prevail.
218	2.5.10.4.1	Each station PSB shall be provided with a Wireless Microphone to gain access to its associated platform(s).	The clause no. 2.5.10.4.1 referring to wireless microphone at each station PSB, whereas clause no. 2.5.10.4.4 is referring to one number wireless microphone per station. Please clarify the no. of wireless microphone per station.	Anomally corrected.Kindly refer to Corrigendum/Addendum , Item No95
219	2.5.10.4.4	One number Wireless Microphone per station shall be provided, incase of Integrchange station 2no. should be provided.	_	Kindly refer to corrigendum/addendum item No 96
220	2.5.10.4.5	New Clause added	_	Kindly refer to corrigendum/addendum item No 97
221	2.5.12.1.1	The PAS / PIDS NMS shall monitor system alarm status on real time basis; alarm data shall also be stored for future inquiries. It is envisaged that one NMS and a corresponding workstation shall be provided. The NMS at OCC shall have jurisdiction over station to depot station and shall extend a workstation to OCC.	_	Kindly refer to corrigendum/addendum item No 98
222	2.5.12.2.1(5)	deleted	_	Kindly refer to corrigendum/addendum item No 99
223	2.6.1.8	(e) All speakers should be EN54-24 or UL certified (f) PA Matrix/ Voice Announcers should be EN54-16 or UL Approved/ Listed. (g) All equipment should be CE approved.	(e) EVAC certification may be added as an option. (f) EVAC certification may be added as option for PAS certification. (g) EVAC certification is relevant for PA system, CE approval is not required therefore CE approval may be deleted.	Bidder request declined.Kindly refer to corrigendum/addendum item No 100

PART A Pre Bid Minutes

224	2.6.2.4.	The index of speech intelligibility (STIPA) measurement values at 95% of the areas for the PAS shall be greater than or equal to 0.5 for all areas. The design shall take into account effects of reverberations. The requirement of STIPA shall be complied with at all public areas like station concourses, platforms, entrances to stations etc.	STIPA requirement of 0.5 (minimum) may be defined for passenger area only and therefore this clause should be revised accordingly.	Bidder request declined. Provision of tender clause will prevail.
225	2.6.3.1.3.	The PAS control equipment shall include all the necessary computer server equipment capable of meeting all the interface requirement with the PIDS and TC&S System.	PAS/PIDS control equipment should be an integrated system, therefore this clause should be revised accordingly (Interface with PIDS should be removed).	Integrated PAS/PIDS control equipment may be proposed.
226	2.6.3.1.9	The audio matrix switch shall be fail safe and shall be capable of being manually bypassed to maintain all zone broadcast availability, if necessary on failure of the audio matrix switch. There should be 2 Audio Matrix Switch at every station for redundancy. Both Audio Matrix should operate in Active - Active configuration. Failure of 1 Audio Matrix should not affect other, hence achieving 50% redundancy on speaker circuits.	One Audio Matrix Switch with redundant critical modules and adequate MTBF value will serve the purpose of required redundancy and availability. This is a purely design methodology. Second part of the clause "There should be ..." may be kindly removed from the clause.	Bidder request declined. Provision of tender clause will prevail.
227	2.6.3.4.3	PAS control panel or MMI at SCR should be latest technology Touchscreen type.	Touchscreen may be deleted as explained at clause 2.5.10.1.1.17 above.	Bidder request declined. Provision of tender clause will prevail.
228	2.6.3.7.1	A minimum 500W Class-D power amplifier shall be provided for each zone at each station.	Specification of power capacity (of minimum 500 W) is not necessary & relevant as other capacity power amplifier will also serve the purpose of application. Therefore 500 W capacity to be replaced with "Suitable power capacity".	Kindly refer to Corrigendum/Addendum, Item No 101
229	2.6.3.7.4	Adequate standby arrangements shall be provided to achieve system availability. At each station 2 Sets 4 amplifiers each shall be provided, Set 1 shall be in Rack 1 & Set 2 shall be installed at Rack 2. Rack 1 shall feed Even Numbered speakers & Rack 2 Shall feed Odd numbered speaker circuits, Failure of Rack 1 will not affect Rack 2 & hence maintain system availability. Electric Power supply for Rack 1 & rack 2 should be separately Routed with different cable to avoid single point of failure.		Kindly refer to Corrigendum/Addendum, Item No 102
230	2.6.3.7.5. (1) &(4)	RMS power output : 500W RMS	Same explanation as at clause 2.6.3.7.1 above.	Kindly refer to Corrigendum/Addendum, Item No 103
231	2.6.3.11.3.	Loudspeaker output power shall be limited to provided a maximum SPL of 100 dB (A).	This clause may not seem to be relevant with Loudspeaker output, in place it is linked with output of amplifier as loudspeaker is derived by amplifier output signal. Clause may be revised accordingly.	Bidder request declined. Provision of tender clause will prevail.
232	2.6.3.11.7.	Loudspeakers shall have a minimum frequency response from 340 Hz to 18 kHz at 10 dB and in case of horn speaker 500 hz – 4.5 kHz at -10 dB.	For Metro Announcement application 340Hz to 15KHZ shall be sufficient. 340Hz to 18KZ is required for playing high quality Music Please accept	Bidder request declined. Provision of tender clause will prevail.
			340Hz to 15KZ. Few outdoor speakers can support only up to 15Kz, and all the PA loop will have the Fault Isolator.	Bidder request declined. Provision of tender clause will prevail.
233	2.6.3.11.8.	The loudspeakers and the loudspeaker cables shall be manufactured from fire retardant, low smoke, low halogen materials. The PAS cables shall be of the fire survival type to ensure circuit integrity for at least 3 hours during fire at 750 degree C temperatures.	This clause may not seem to be relevant with Loudspeaker, it is relevant with loudspeaker cables only. Clause may be revised accordingly.	Bidder request declined. Provision of tender clause will prevail.
234	2.6.3.11.13	Ceiling PA speakers shall be minimum 30 watts, with a minimum of 4 discrete tapings & shall be installed in Concourse areas where False ceiling is available.	Suitable power output for ceiling loudspeakers may be mentioned in the clause in place of specific 30 W power output as other lower wattage ceiling speakers will serve the purpose in this application also. Please confirm the power requirement of ceiling PA speaker. 30 watts is not a standard design. As a standard used in current metro's 5W ceiling PA speakers are used.	Kindly refer to Corrigendum/Addendum, Item No 104
235	2.6.3.11.14	10W Wall mounted shall be minimum 10 Watts PA speakers shall be provided in Service areas/rooms for emergency announcements.	Suitable power output for Wall mounted loudspeakers may be mentioned in the clause in place of specific 10 W power output as other wattage wall mounted speakers will serve the purpose in this application also.	Bidder request declined. Provision of tender clause will prevail.
236	2.6.3.11.15	Column (Line Array) Loudspeakers shall be Minimum 80 watts & shall be used in large indoor and covered environments like covered part of platforms, waiting rooms, lobbies, ticketing/enquiry areas etc.	Specific column loudspeakers may be removed from the clause as other types of speakers like wall mounted speakers with lower wattage will serve the purpose in this application also.	Kindly refer to Corrigendum/Addendum, Item No 105

PART A Pre Bid Minutes

			Please confirm the power requirement of column PA speaker. 80 watts is not a standard design. As a standard used in current metro's 10W ceiling PA speakers are used.	
237	2.6.3.11.16	All 3 types of speakers i.e. Ceiling, Column & Wall Mount shall be aesthetically elegant looking, NMRCL authority will have right to disqualify the speaker based on aesthetic appearance. NMRCL may ask Samples of speaker during bidding procedure for Approvals.	Only 2 types of loudspeakers viz. ceiling & wall mounted type will be sufficient for this application. Clause may be revised accordingly.	Bidder request declined. Provision of tender clause will prevail.
238	2.6.3.11.17.	All above speakers should be UL or EN54-24 Approved	EVAC approval may also be added as an option for certification of Loudspeakers.	Bidder request declined. Provision of tender clause will prevail.
239	2.6.3.11.18.	All speakers should be from same OEM as that of PAS System Supplier.	(1) This requirement may lead to monopoly of the OEM. Request you to give flexibility to choose different OEM for speakers, amplifiers and all other equipments of PAS system which shall meet all contractual requirements. (2) OEMs of Loudspeakers & PA system/ may be different. Loudspeaker is one of the components in large PA system only and linking same OEM of loudspeaker with PA system will limit the no. of OEMs. Therefore this clause may be deleted.	Bidder request declined. Provision of tender clause will prevail.
240	2.6.3.13.1 (a)	All equipment of the PAS shall work from 240 volts 20 % AC single phase power supply and connected to a dedicated UPS to be supplied as part of N1S01 contract. Refer to clause 2.3.4.2 of this chapter.	As per RFP UPS will be supplied by N1S01 contractor. Kindly clarify following, 1. Do SI have to consider power distribution panels/boards for UPS output for each system 2. Whether the DBs should be common or separate for each system. 3. How much will be the distance of UPS power supply to PAS control room & each loudspeaer (system requires power supply) 4. How far will be UPS (S&T) room from TER/CER/OCC	1. Bidders understanding is correct . 2. Commomn DB will be provided by N1TL01 contractor in TER/CER for communication System. 3. & 4. These are part of detail desgin,
241	2.6.3.13.1. (b)	each PAS cabinet shall be provided with batteries which will allow the system to be in operations for a minimum of 30 minutes in voice alarm condition in case of mains power fail	(1)The power requirement of power amplifiers is very high to operate them on batteries. The TS clause 2.4.3.6 is already ensuring 50% speaker availabilty. Please confirm. (2) Batteries are not needed in the PAS cabinet as PAS system is operated from controlled& redundant power source - UPS.	Kindly refer to Corrigendum/Addendum, Item No 106
242	2.6.6.3.	7 . 5 x outer diameter	For Armoured cable cannot be bended to 7.5 X outer Dia due to armouring present on the cable.This should not be applicable for armoured cable .Please confirm	Bidder request declined. Provision of tender clause will prevail.
243	2.6.6.1.1	Conductors 1) The conductors shall be of stranded, high conductivity annealed copper wire complying with all the requirements of IEC 60228 and BS 6360.	-	Kindly refer to Corrigendum/Addendum, Item No 107
244	2.6.7.	In addition to the requirements specified in Chapter 11, Appendix D of this TS, following specifications shallbe complied with my Microphone cables (for cables not having RDSO / TEC specifications)	The cables specified for the PAS, PIDS & MCS equipment are not covered by specifications issued by RDSO/TEC, therefore clause may be revised accordingly.	Kindly refer to Corrigendum/Addendum, Item No 108
245	2.7.10	PAS Interface to Security Alarm System An interface with the Security Alarm System will be provided. This interface will be used for making security announcements in case of security or safety based events. The interface either IP level or hard wired. In event of hard wired interface, the interface box shall be placed in the TER. Wiring to the PAS server beyond the interface box shall be responsibility of PAS (N1TL01) Contractor.	(1) Interface with Fire alarm system is covered in TS clause 2.7.9. Please clarify on exact interface requirement of security alarm system. (2) Kindly elaborate what is Security Alarm System. Also, please advise which contractor will provide Security Alarm system and at which all locations this interface is required.	Security alarm is interface between CCTV & PAS. Details of interface already elobrated in clause.
246	2.7.12.	12) 30W Ceiling Speakers 13) 10W Wall Mount Speakers 14) 80W Column Speakers Minimum Bill of Quantity (BoQ)	Description of Speakers in BOQ may be changed as explained under clause 2.6.3.11.13, 2.6.3.11.14, 2.6.3.11.15 & 2.6.3.11.16 above. (1)As per minimum BOQ speaker watt is defined in the PS. Can we select the speakers as per Acoustic simulation to meet the STI and SPL required in the tender. Please confirm. (2)As per minimum BOQ speaker watt is defined in the PS. Can we select the speaker as per coverage requiument to Met the STI and SPL required in the tender	(1)Minimum BOQ defined in pricing schedule. Kindly refer to Corrigendum/Addendum, Item No 31 (2) This clause deleted ,Kindly refer to Corrigendum/Addendum , Item No 109
		Centralized Monitored	As per PS and BOQ given, we understand that redundant centralized PAS system is required for Nagpur metro project, No local server is required on the station. Please Confirm	Local server at station shall be required.

PART A Pre Bid Minutes

		Touch Screen MMI is Required	As per PS touch screen MMI is required ,To optimised hardware can we provide all in one workstation. Please confirm.	Bidder request declined. Provision of tender clause will prevail.
Part II		Section VII-B,Works Requirements Technical Specifications Chapter 3 (PIDS)		
247	3.1.1.1c	New Clause added		Kindly refer to Corrigendum/Addendum, Item No 110
248	3.1.1.2	The wiring for extending the PIDS data to these boards is to be catered for as part of the Contractor's work, even though some of these boards might come up subsequently. The PIDS shall also display other appropriate pre-determined, fixed, pre-formatted messages and free-entry text messages regarding safety, train delays and emergencies, etc.	It is mentioned that "some of these boards might come up subsequently". Kindly advise the locations where this is applicable.	Location of these boards shall be at stations area of the Nagpur Mtero
249	3.1.1.4.	Use of TFT Backlit Full HD LCD pannel (a) Platfrom visual information displays : TFT Backlit Full HD LCD Panel (b)Concourse (Paid / Un paid) visual Information Displays TFT Backlit Full HD LCD panel	(1)Only TFT backlight HD LCD is required,No LED display is required on Platform. LED technology based Display Boards are most suitable for platform areas due to ambient lighting conditions. TFT LCD panels will have poor visibility & poor readability in platforms. Therefore LED display baords need to be placed at platforms in place of TFT panels in all relevant clauses of the document..	LED display Board at Platform is not acceptable. Kindly refer to Corrigendum/Addendum, Item No 111
			(2)Bidder assume that LED display's can also be proposed	
			LED technology based Display Boards are most suitable for platform areas due to ambient lighting conditions. TFT LCD panels will have poor visibility & poor readability in platforms. Therefore LED display baords need to be placed at platforms in place of TFT panels in all relevant clauses of the document..	
			(a)Platform areas are semi-exposed to outer environment with more sunlight. LED matrix based display boards are prefered in such environmental condition. Please advice. (b)LED technology based Display Boards are most suitable for platform areas due to ambient lighting conditions. TFT LCD panels will have poor visibility & poor readability in platforms. Therefore LED display baords need to be placed at platforms in place of TFT panels in all relevant clauses of the document..	
250	3.1.1.5. (A)	The PIDS server shall be located locally in each station TER and networked to the main PIDS server located within the OCC TER via the data transmission network. The PIDS Subsystem will adopt decentralized architecture with redundancy built at both at station and at OCC TER level. System shall be configured such that in event of failure of Central equipment at OCC TER, station will be able to provide all information and functionalities from the local HMI.	PAS/PIDS control equipment or server should be an integrated system for user's ease of operation and same is being used in other metros in India & worldwide, therefore this clause and all relevant clauses of the document.should be revised accordingly (Integrated PAS/PIDS server should be written in place of PIDS server). Redunant PAS/PIDS server is required at OCC level only, not required at station level. Therefore, redundancy to be removed from station level.	Bidders request accepted. Kindly refer to Corrigendum/Addendum, Item No 112
251	3.1.1.6	The integrated PAS / PIDS HMI at each station shall be able to monitor and, if required override the information presented on the PIDS Displays and shall provide the SCR operators with the facility to display		Kindly refer to Corrigendum/Addendum, Item No 113
252	3.1.1.9	The display panels shall be based on TFT Backlit Full HD Panels for other than Platform. Panels for TFT Backlit Full HD display screens for concourse public areas and other locations to be as per latest specifications. TFT Backlit Full HD display screens shall provide additional facilities for display of commercial messages / video clips. The Contractor shall submit details of TFT Backlit Full HD LCD pannel for Employer's approval before procurement. The Contractor shall take due account in the design, site installation and commissioning of the Passenger Information Display System of the distinct stages of bringing the system into operational service.	(1) The TS clause 3.1.1.9 refers to TFT backlit full HD panels other than Platforms, whereas TS clause 3.1.1.4(a) is referring to TFT backlit full HD panels at platform. As per our understanding TFT backlit full HD panels are more suitable for Concourse areas. Please advice.	Anomaly corrected. Kindly refer to Corrigendum/Addendum, Item No 114
			(2) Clause 3.1.1.4 mentions that "Platform Visual Information Displays ; TFT Backlit Full HD LCD pannel" which is contradictory to the statement in clause 3.1.1.9 "The display panels shall be based on TFT Backlit Full HD Panels for other than Platform." Kindly advise.	

PART A Pre Bid Minutes

253	3.3.1.2.12	e) All alarms reported to the PIDS management system shall be associated with an audible tone which can be enabled or disabled by the system administration operator on the PIDS management workstation.	Does it require to equip with an additional alarm box for alerting?	Yes , it is required . No change in TS requirement.
254	3.3.1.2.1.(a)	A PIDS central server shall be located in the OCC TER which shall be connected to the PIDS station server equipment at each station TER via the data transmission system. The PIDS central server shall have redundant architecture and connectivity to workstation HMIs with mirroring of disks for high reliability.Or Bidder may propose a Virtualized solution by having all services applications, Database,Management servers including other system applications in Virtualized manner to optimize the solution hardware etc as per bidder design.In such case Subsystem/system redundant	Redundancy requirement at PIDS display level is required or not is not clear. please clarify. (1) Common central server with integrated PAS/PIDS MMI for PAS & PIDS functionalities shall be located at OCC TER and the clause may be revised accordingly. (2) Redundancy requirement at PIDS display level is required or not please clarify. Common central server with integrated PAS/PIDS MMI for PAS & PIDS functionalities shall be located at OCC TER and the clause may be revised accordingly.	PIDS display level redundancy required, it shall be required to have no single point of failure . Tenderer to propose detailed technical proposal accordingly . (1) Bidders request accepted. Kindly refer to Corrigendum/Addendum, Item No 115 (1) PIDS display level redundancy required, it shall be required to have no single point of failure . Tenderer to propose detailed technical proposal accordingly . (2) Bidders request accepted.Kindly refer to Corrigendum/Addendum , Item No 115
255	3.3.1.2.2.	PIDS Station Server	local server is mentioned at each station TER with redundancy built at station. But required functionality can be achieved with centralized system. Please clarify	Local server at station shall be required.
256	3.3.1.2.2.(a)	a) At each station a PIDS station server shall be located in the TER, which shall operate in conjunction with the central PIDS servers, the station PIDS information display equipment and the PAS/PIDS HMI in the SCR for local system monitoring and operator access. OR Bidder may propose a Virtualized solution by having all services applications, Database, Management servers including other system applications in Virtualized manner to optimize the solution hardware etc as per bidder design.In such case Subsystem/system redundant software shall be residing in separate server other than primary application server which should work in Hot standby mode such that the overall system performance & functionality RAMS requirement as specified in TS shall be achieved.System shall be designed so that single point of failure does not paralyse the normal operation	Same remarks as mentioned against clause 3.1.1.5 & 3.3.1.2.1 above.	Bidders request accepted. Kindly refer to Corrigendum/Addendum , Item No 116
257	3.3.1.2.5 (c)	Platform Visual Information Displays c) The Contractor shall, as required, make additional provision for displays at certain platform at the stations which have curvature. d) Each double sided display shall be fully visible to a normal sighted individual, from a minimum distance of 18 meters while viewing from the centre point along the platform width.	(c) Kindly advise the stations for which additional provision for displays needs to be considered including the additional quantities. This is required for BoQ estimation purpose. (d) The visibility of TFT Backlit Full HD panels are limited to 15m in semi-exposed area. Here it is platform, however LED board based displays can be viewed from the distance of 45 meters. Kindly advise if LED board based display can be considered for platform areas.	(c) provision of additional of equipment to be estimated by bidder based on available alignment/station drawings. The final qty shall be decided during the final design stage . (d) Bidder request declined. Provision of tender clause will prevail.
258	3.3.1.2.5 (b)	Each platform shall be equipped with a minimum of two LCD displays. One double- sided LCD Pannel shall be mounted at 18 m from the centre of the platform (towards the normal stopping point of the train in the concerned direction)	The requirement for LCD displays is different from the requirement in PART I: BIDDING PROCEDURE SECTION IV: BIDDING FORMS ANNEXURE IV-B: PRICING DOCUMENT 6. BOQ for PAS/PIDS System line 6 : Double Sided platform Display Board (LED) for Elevated Stations. Please confirm the platform display board is LED or LCD. There is no reference about the 2-sides LCD monitors in BOQ table, though it has been referenced here . We would also request for the Size of these Displays. Kindly provide the dimensions of these displays.	Kindly refer to Corrigendum/Addendum , Item No 117
259	3.3.1.2.6 (b)	Concourse areas Visual Information Displays b) The displays shall be installed in the unpaid side of the gate line, as close as possible to the station entrances and also above or adjacent to, the ticket gate lines.	Kindly advise if we need to consider the displays both for station entrances as well as ticket gate lines.	Requirement in the TS is self explanatory .Kindly refer to Corrigendum/Addendum , Item No 118
260	3.3.1.2.6 (e)	Each display shall be fully visible to a normal sighted individual, when standing or sitting in a wheelchair, at a minimum distance of 35 meters from the display.	-	

PART A Pre Bid Minutes

261	3.3.1.2.7. (g)	g) The PIDS display housing shall provide cable access from the top and bottom of the unit and shall be equipped with internal cable termination facilities together with an earth terminal for termination of external cables;	Clause may be revised to as below. The PIDS display housing shall provide cable access from the top or bottom of the unit and shall be equipped with internal cable termination facilities together with an earth terminal for termination of external cables.	Bidders request accepted. Kindly refer to Corrigendum/Addendum , Item No 119
262	3.3.1.2.12 (c)xiii	Message priority conflict.	-	Kindly refer to Corrigendum/Addendum , Item No 120
263	3.4.1.1.4	Indicative quantity of Display Boards to be provided at stations is as under:	-	Kindly refer to Corrigendum/Addendum , Item No 121
264	3.5.1.3.4	The service life of the PIDS equipment shall not be less than 15 years, for cables it shall be 25 years and for workstation/servers, it shall be 10 years.	As per our understanding, the service life of servers and workstations is very less and not 10 years. We suggest that keeping the current industry norms, to specify this as 5 years. Kindly advise..	Bidder request declined. Provision of tender clause will prevail.
265	3.5.1.4.3	The PIDS shall produce images with a minimum contrast ratio of 20: 1 when operating in all ambient lighting conditions including artificial lighting and natural lighting.	-	Kindly refer to Corrigendum/Addendum , Item No 122
266	3.5.1.4.9 (c)	Specific locations to achieve optimum viewing distances and viewing angles.	-	Kindly refer to Corrigendum/Addendum, Item No 123
267	3.5.1.6.16.	On train departure at a station the Signalling equipment shall initiate a signal, via the local PIDS server, to clear the 1st line of the relevant PIDS displays, showing the train arrival/departure information. This shall also result in resetting, in the correct order, the presentation on the displays of subsequent trains.	The interface between PAS/PIDS server & signalling system is at central server located in OCC TER. Therefore Word “local PIDS server” to be changed with “PAS/PIDS central server”. This seems to be a typographical error.	Central ATS at OCC Level is required whereas Interface with Local - ATS is required at Station Level.
268	3.5.1.7.5	During normal operation every message shall be displayed in both the languages. However, facilities shall be provided for the station and OCC operators to display messages in one language or the other, as the situation demands.	-	Kindly refer to Corrigendum/Addendum, Item No 124
269	3.6.1.1.18	The intensity of illumination shall be such that it is possible to read the information clearly from a distance of minimum 35 metres	-	Kindly refer to Corrigendum/Addendum, Item No 125
270	3.6.1.1.20	a. two types of fonts for Marathi and Hindi characters. b. two types of fonts for Marathi and Hindi characters.	Clause (a) & (b) are repeating.May be corrected.	Bidders request accepted. Kindly refer to Corrigendum/Addendum, Item No 126
271	3.6.1.2.1	The PIDS management system shall be equipped with Linux/ WINDOWS based operating system to support the specified management functions	-	Kindly refer to Corrigendum/Addendum , Item No 127
272	3.6.1.2.5.	PIDS Management System	NMS Required is only for IT hardware as all other alarms will be displayed on PIDS/PAS MML.Please clarify	Please be noted that PIDS management System is a requirement . Bidder request declined. Provision of tender clause will prevail.
273	3.7.1.1.12	The PC-based control equipment shall be industrial grade PC model. The PC-based control equipment shall function normally from -5 to +55 degree C (ambient) and with relative humidity ranging upto 99%.	Pls accept Humidity range upto 95%.	Bidder request declined. Provision of tender clause will prevail.
274	3.7.1.5.	Maintainability Requirements The Mean Time to Restore, not including travel time,the PIDS to full normal operation following a failure shall be less than four (4) hours all inclusive. However, it shall be ensured that overall availability requirements as specified in this TS is complied / ensured.	Travel time should be excluded from MTTR which is reflecting at one place while this is included at second place in the same sentence. This seems to be a typographical error. Clause may be revised	Bidders request accepted. Kindly refer to Corrigendum/Addendum , Item No 128
275	3.8.1.1.3	Fault Reporting Subsystem for monitoring of fault alarms for local display and monitoring of PIDS Subsystem. Terminals of the FRS shall be located in OCC.	Kindly clarify the postion at OCC for FRS terminal.	Fault reporting server shall be installed in CER of OCC & BCC
276	3.8.1.3.1.	Acoustic noise and vibration;	This clause seems to be non-relevant for PIDS.	The TS requirement has been deleted . Kindly refer to Corrigendum/Addendum, Item No 129
277	Annexure A	Provisional Bill of Quantity for Passenger Information Display System of Display Units to be provided at various locations	-	Kindly refer to Corrigendum/Addendum, Item No 130

PART II		Section VII-B, Works Requirements Technical Specifications (MCS)		
278	4.1.2.1	The Master Clock System shall be compliant with ITU-T G.811. It will serve as Primary Reference Clock (PRC) for all clock functions of the Metro. The Master Clock shall provide synchronised time signals received by radio communication from orbiting GPS satellites. The Master Clock shall derive Coordinated Universal Time (UTC) from received GPS satellite signals and shall convert this to local Indian Standard Time. The N1TL01 Contract shall provide the Master Clock for Date & Time signal also so that it can act as NTP server for the Master Clock System of NMRCL network.	We understand PRC E1 / 2048 MHz output is not required in terms of frequency synchronization considering no SDH equipments available as PRC E1/2048 MHz O/P is used to synchronise SDH equipments. Please confirm if PRC in terms of time synchronization (NTP) is only requirement.	Bidders request accepted. Kindly refer to Corrigendum/Addendum, Item No 131
279	4.1.2.2	(3) Sub-master clocks at each of the stations / depot/OCC/HQ or Bidder may propose a solution without sub master clock however the proposed solution should meet the overall system requirement as specified in this TS and the expected functionality from submaster clock is to be achieved through master clock. (5) All power and signal cables, surge protection devices etc. (6) Both primary and secondary fixtures for installation;	Sub-master clocks are generally for stations, Depot, BCC and/or HQ. At OCC, Master clock unit shall be located which shall interface with sub-master clocks of stations, Depot, BCC and/or HQ. Clause may be revised accordingly to remove word "OCC".. Whether Surge Protection Device (SPD) should be external device or inbuilt in Master Clock system. Kindly elaborate primary and secondary fixtures for installation	Kindly refer to Corrigendum/Addendum, Item No 132
280	4.1.2.4	Visual Time-of-day The MCS shall provide time-of-day display clocks at stations, OCC and other depot areas. At stations and important locations, analogue and digital display clocks shall be provided for benefit of passengers and operational staff. The MCS shall provide time-of-day display clocks at OCC, SCO, DCC etc.	Kindly advise what does SCO stands for?	SCO to be read as Station Control Room
281	4.2.1	A Master Clock protocol converter to deliver time-of-day and date to display clocks. A Master Clock Server to deliver Network Time Protocol (NTP) or Precision Time Protocol (PTP) as required by other subsystems. Subsystems that are not compliant to IEEE-1588 shall receive NTP. Subsystems compliant to IEEE-1588 shall receive PTP.	Incase no PTP clients are available please confirm if we only propose NTP server.	Option of NTP or PTP already given in clause
282	4.2.1	The GPS Receiver/Decoder Unit, located adjacent to the antenna, shall continuously collect the external time information for the Master Clock Subsystem. A Master Clock protocol converter to deliver time-of-day and date to display clocks.	The clause refer to separate devices for GPS receiver, protocol converter. However, nowadays a master clock integrates usually these functions as built-in components.	Bidder request declined. Provision of tender clause will prevail.
283	4.2.3.	Display Clocks Digital Display Clocks - Platforms Digital Display Clocks Station Public Area Digital Display Clocks Station Control Rooms Digital Display Clocks OCC, SCO, DCC Digital Display Clocks RSS Analogue Display Clocks Station Platform Analogue Display Clocks Large Office Areas Analogue Display Clocks Small Offices Analogue Display Clock Depot Lobby Digital Display Clocks Depot Main Workshops	Double sided analogue clocks should be for station platforms only, not for large office areas, small offices & Depot Lobby. Clause may be revised to delete analogue clocks from these areas. As per defined BoQ and specifications there is no analogue clocks in the office rooms and depot lobby whereas these are mentioned here for Large office areas, Small offices and Depot lobby. Please advise and confirm if digital clocks are required in these areas. Double sided analogue clocks should be for station platforms only. Kindly advise where the large office areas and small offices referred in this clause are located.	Kindly refer to Corrigendum/Addendum, Item No 133 (1) Kindly refer to Corrigendum/Addendum, Item No 133. (2) Minimum BOQ modified, Kindly refer to Corrigendum/Addendum, Item No 31 These are located in Metro Bhavan & other office of NMRCL
284	4.3.2.1 (5)	Master Clock System – Network Management System or Bidder may propose Virtualized solution by having all services applications, Database, Management servers including other system	-	Kindly refer to Corrigendum/Addendum, Item No 134
285	4.3.2.1 (6)	Clock signal and power supply cables, earthing and accessories including termination protection devices; provision of backup batteries;	1. Earthing shall be from exstaina earth bus bars 2. Location of earth bus-bar and distance between earth tapping point to each clock. 3. Termination protection device means MCB/ELCB/Switch-Socket	1. earthing is from BUS bar in TER/CER. 2 These are part of interface with E&M Contractor & will be decided during detail desgin. 3. Bidders understanding is correct

PART A Pre Bid Minutes

286	4.3.3.3	In addition, the N1TL01 contractor shall co-ordinate with Civil Works Project Contractors and provide comments or recommendations on subject of station building materials, finishes and architectural layouts, for best acoustic performance.	Material with proper Noise reduction coefficient, sound absorption co-efficient, good absorption quantity etc. must be used by civil sub-contractor in order to achieve the RT values mentioned in 2.4.1.6 Table-2 Reverberation time targets. Please confirm compliance of this requirement from Civil sub-contractor. This clause seems to be non-relevant for Mater Clock System, hence may be deleted.	Kindly refer to Corrigendum/Addendum, Item No 135
287	4.5.2. (5)	Sub-master clock shall supply timing signals to the voice and video recording equipment, the train control & signalling system, FOTS, PIDS, PAS, Radio, Telephone system, CCTV System, power supply computer (SCADA), PSD, other SCADA systems, the AFC central computer and other necessary equipment.	(1) Master clock unit at OCC shall be interfaced with other third party systems viz. FOTS, Radio, Telephone system, TC&S system, CCTV system, AFC computer etc.. Sub-master clocks are provided for stations, Depot, BCC and/or HQ where interfacing with these third party systems are not relevant. Therefore word "Sub-master clock" to be changed with "Master clock". PI clarify (2) We understand that in the absence of valid Sub-Master Clock signal, only the digital slave clocks will operate in free running mode with an internal clock supplying the time signals as free running mode is not applicable for analogue clocks. Please confirm.	Bidder request declined. Provision of tender clause will prevail.
288	4.5.4.	The Sub-Master Clock system shall provide appropriate clock output interfaces for master clock and timing and reference distribution. The type and quantities of the clock output interfaces shall be determined by the interfaces requirements of the subsystems (PAS, PIDS, Radio, CCTV, CDRS, Telephone System etc) and relevant interfacing project contractors (Traction, Fare Collection, Train Control and Signalling etc.). Suitable interfaces (such as RS-422 or RS232 or LAN connections) for clock output interfaces shall be supported.	(1) Sub-master clock shall provide appropriate clock output interfaces for slave clocks, not for Master clock, for timing reference distribution. Third party systems are interface at OCC generally with Master clock unit, not with Sub-master clocks. The reference of the third party systems may be deleted from this clause. In addition to RS-422, RS232 and LAN interface, AFNOR NFS 87500 which is an Industry standard open protocol, may also be included. (2) Sub-master clock shall provide appropriate clock output interfaces for slave clocks, not for Master clock, for timing reference distribution. Third party systems are interface at OCC generally with Master clock unit, not with Sub-master clocks. The reference of the third party systems may be deleted from this clause.	Bidders request declined.
289	4.5.5.	Clock output interfaces of Suitable standards (such as RS-422 or RS232 or LAN) in form of suitable outlets (such as RJ-45) shall be provided within station concourse and platforms at locations where the station clocks are mounted. Similar arrangements shall also be provided for OCC, depot and NMRCL HQ. The Sub-Master Clock at stations shall also provide reference clock for PIDS Clock Display.	In addition to RS-422, RS232 and LAN interface, AFNOR NFS 87500 which is an Industry standard open protocol, may also be included.	Bidder request declined. Provision of tender clause will prevail.
290	4.5.8.	Digital Slave Clocks to be built to Open Protocol DCF-77 or NTP and to work on this Open Protocol only.	In addition to RS-422, RS232 and LAN interface, AFNOR NFS 87500 which is an Industry standard open protocol, may also be included. AFNOR NFS 87500 has distance advantage over mentioned protocol and also used world wide metro environments.	Bidder request declined. Kindly refer to Corrigendum/Addendum, Item No 136
291	4.6.2.1	The overall Clock system accuracy shall be better than +/- 0.01 seconds per 24 hours. The clock accuracy of the Master Clock Unit shall be better than 1x10 ⁻⁵ in free running mode without the input of GPS signal. The Master Clock System shall comply with the ITU-T Recommendations: G.811 concerning time Characteristics and requirements.	(1) To our understanding, the overall clock system accuracy refer to the accuracy per 24h during normal operation (with GPS synchronization). Please confirm if it's correct. (2) Please confirm if SDH is available, if not there is no meaning to provide PRC/G.811	Kindly refer to Corrigendum/Addendum, Item No 137
292	4.6.3.1.1	The equipment design shall be with plug-in units	The equipment will be provided with redundancy features. Please confirm if "Plug-in" requirement can be exempted. Kindly confirm if the modular design is acceptable complying with the contractual requirements in place of equipment design with plug-in units.	Plug in units requirement is essential. Bidder request declined. Provision of tender clause will prevail.
293	4.6.3.1.2	A Summary alarm shall be provided at the rack top to indicate the alarm status of any element within the rack. The summary alarm shall be reset automatically upon the alarm is cleared	Normally this requirement of indicating alarms is linked with SDH network. Also in the RFP, in the Rack specifications, this requirement is not mentioned. Please confirm if this requirement is mandatory?	Bidder request declined. Provision of tender clause will prevail.

PART A Pre Bid Minutes

294	4.6.3.1.5	The master clock system shall work from 48 V +/- 20% DC or 240 AC UPS with an internal battery backup of atleast 4 hours.	(1)We understand that the internal battery backup is required for running only the internal clock and not for the external ones, since these are already backed up by the UPS power supply. Kindly confirm.	Bidders understanding is correct
			(2)We understand that the internal battery back up is referred to RTC (Real time clock) to maintain adequate time in case of failure of power supply.	
			Provide clarification on following points, 1. Power supply tapping point distance from master clock location 2. Scope of supply UPS. Whether by NILT 01 contractor or N1S01 contractor. 3. Type (online/Line Interactive), Rating of UPS. 4. Location of UPS for Smart Clock system	
295	4.6.3.1.7	The design of the slave clocks shall be of high quality and blend into the architecture of the area in which they are located. All slave clocks shall be programmable both for 12 hours and 24 hours. Clocks shall be provided as follows:	(1)Kindly update as "Alldigitalslave clocks shall be programmable both for 12 hours & 24 hours	Kindly refer to Corrigendum/Addendum, Item No 138
			(2)Display analogue and digital at various locations clocks are considered to display 4 characters viz., time in HH:MM format and date (in case applicable, alternative to time) in DD:MM format. Please confirm this understanding	
			(3)Time programming of 12 hours & 24 hours shall be applicable for slave digital clocks. Clause may be revised by mentioning "slave digital clocks" in place of "slave clocks".	
			(4)Please confirm the characters / format of display viz., Hour Minute or Hour, Minute and seconds for analogue and digital slave clocks. Also please define the ingress protection degree for slave clocks.	
			(5)We understand that these clocks need to be installed near AFC gates and not at each staircase/escalator at concourse leading to station area (concourse) from road level. Please confirm.	
			Display analogue and digital at various locations clocks are considered to display 4 characters viz., time in HH:MM format and date (in case applicable, alternative to time) in DD:MM format. For analog clock, Hours and minutes Hand may considered. Please confirm this understanding	
296	4.6.3.1.8	The sub-master and slave clocks (digital) shall have internal battery backup of atleast 4 hours.	We understand that the internal battery back up is referred to RTC (Real time clock) to maintain adequate time in case of failure of power supply.	Bidders understanding is correct
			We understand that the sub-master clock and slave digital clocks should be provided with 4 hours battery backup for running internal clock in the absence of time synchronisation with master clock and sub-master clock respectively.	
297	4.6.4.2	New Clause added	-	Kindly refer to Corrigendum/Addendum, Item No 139
298	4.7.3.2	New Clause added	-	Kindly refer to Corrigendum/Addendum, Item No 140
299	Annx A	BOQ	-	Kindly refer to Corrigendum/Addendum, Item No 141
Part 2		Chapter 5 Voice Recording System(VRS)		
300	5.1.1.1	Voice Recording System	There is a mention of the Voice Recording System in the technical specification but there is no reference of this system in the BOQ ?	Kindly refer to Corrigendum/Addendum, Item No 31
301	5.1.2.1.	CDRS facility shall be provided in OCC. CDRS Shall provide multichannel voice recording and indexing of direct line communication including communication from all direct line consoles and emergency telephone lines, two way radio communications, emergency or fire messages broadcast on station PAS initiated from OCC and on train borne PAS initiated from OCC..	What is the interface for PAS and the Microphone? We assume that the interface for both of them is analogue. Therefore it means it is physical (analogue), hence it can not be on Virtualized solution. Please confirm if this understanding is correct. Is the PAS and Microphone Analogue or VOIP?	(1) Interface for PAS & Microphone shall be IP. (2) Kindly refer to Corrigendum/Addendum, Item No 142
302	5.1.2.3.	Integrated recorder shall be provided for recording all calls on the corridor.	What does "Corridor" mean?	In the project we have two Corridors 01 . North - South Corridor 02 - East West Corridor
303	5.3.2.1. (3)	CDRS has to be provided a back-up at Depot or any other approved convenient location	Requirement states CDRS in Depot then in other points only in OCC & BCC. Please clarify what is required in Depot?	CDRS Back up may be provided in Depot or in BCC , this shall be defined during the design phase .
304	5.3.3.3	In addition, the contractor shall interface and coordinate with relevant contractors for telephone System, PAS, Rolling Stock, etc.	Kindly clarify the requirement of CDRS interface with Rolling Stock	Please refer 5.6.2.1.2

PART A Pre Bid Minutes

305	5.4.2.2.	As per the design requirements CDRS has to be provided a back-up at Depot or other approved location. Contractor shall provide MTBF values for the CDRS and submit calculations for the availability of the designed system.		There is no query/suggestion from bidder
306	5.5.1 (1)	A multi channel, rack mounted, IP Based Centralized Digital Voice Recording System (CDRS) shall perform the following: (1) direct line console with the direct line consoles at OCC; (the minimum number of channels same as the number of Direct Line Consoles in the OCC, to ensure that all the communication from and to the Consoles in OCC is recorded) Interface between CDRS and the direct line system shall be at Ethernet or Digital port level. The exact interface to be mutually finalised with telephone contractor.	Please advise the interface type (digital or analog) for each subsystem (eg. PAS, emergency phones, Telephony, etc) in order to determine the location of the recorder. Please also advise the number of channels/capacity for the following: 1. Telephony 2. PAS requirements. 3. Free space recording 4. Any other recording requirement	Details are already mentioned in clause. Interface between different sub system is the responsibility of SI. Since all the system are IP based accordingly interface will be digital. Requirement of channel for different subsystem is part of interface & design., Kindly refer to Corrigendum/Addendum, Item No 143
			Digital ports are requested but not defined in the BOQ. Can you please advise if digital lines are used.	It is Ethernet or Digital port level,
307	5.5.1. (3)	emergency broadcast on train borne PAS initiated from OCC through RCW;	What is the Emergency broadcast & PAS interface to CDRS? Analog or IP?	It should be IP based .
308	5.5.1. (4)	live/emergency broadcast on station PAS initiated from OCC		There is no query/suggestion from bidder Kindly refer to Corrigendum/Addendum, Item No 144
309	5.5.1 (5)	Recording of free space voice conversations of all Controllers in SCO Room, DCC Room, and OCC Theatre. The micro phones shall be so placed in SCO, DCC, OCC to enable clear recording of all controller positions without any mixing / disturbance.	(1)Please clarify what is SCO Room and where it is located. In terms of the free space conversations to be recorded please provide: 1. No of the controllers in OCC Theatre. 2. Installation preferences for the Mic 3. Tentative Cable length from the CER. We consider there is no requirement for the BCC, and the recording for all locations will be done locally.	Please read SCO as Station Control Room . 1. 10 controller may be considered for design 2 Installation of Mic is part of design 3. Tentative cable length is part of design.
			(2)We understand that SCO Room will be located at OCC only. Please Confirm.	Please read SCO as Station Control Room .
310	5.5.3	The Contractor shall interface the Radio System with the multi-channel digital voice recorder in main and hot-standby mode of operation, for the recording of all radio communications including Private Calls between any Radios (except DMO for all radios).The number of Channels in the recorder should be sufficient to record all communication as per clause 5.1 above and to archive this information for at least 4 weeks duration.	We clarify in addition to the DMO calls, the LST mode calls will also not get recorded. Please revise the requirement.	Bidders understanding is correct
311	5.5.15.	Control, administration and management function shall be provided through the front panel of the CDRS or a Workstation (to be supplied) connected to the CDRS and the following functions, as a minimum, shall be provided:	Points 1 to 6 are relevant for analog/digital recording and not to IP-PBX. Please advise on the relevancy of this requirement?	CDRS should be able to record IP phone ,digital phone analogue Phone recording through TCP/IP and E1 .
	5.5.15.(1)	audio monitoring of any channel under recording or playback mode;		
	5.5.15.(2)	recording medium movement control including playback, fast forward, fast backward, record, stop and pause;		
	5.5.15.(3)	recording medium counter indicating the recording time elapsed;		
	5.5.15.(4)	recording medium movement indicator;and		
	5.5.15.(5)	display of operation status including power on/off, current time, channel number, operation mode.		
	5.5.15.(6)	Export of the recorded conversation between any two parties, so that it can be played back on any Computer with standard commercially available software for playing back audio files. The conversation between two parties shall automatically be played back in the actual sequence of conversation between the two parties.		
312	5.5.16.1.	The audio recorder shall automatically and continuously record both analogue and digital speech channels providing high voice quality on playback of recordings.	This requirement states analogue/digital. But the Telephone BOQ and 5.5.1. states IP. Please clarify	Bidder to propose solution with analogue , digital and IP phone extensions based on design of telephone (whether hybrid or end to end IP).

PART A Pre Bid Minutes

313	5.5.16.2.	Line inputs shall include, as a minimum, for Voice over IP -VoIP (SIP, RTP, ITU-T-H.323, H.325, H.248 and MGCP), Skype, digital ISDN (PRI and BRI), analogue voice channels, CTI circuits and facsimile.	Please advise if Skype or digital ISDN (PRI and BRI) or analogue are to be used?	IP - PBX shall be compliant to Standards as mentioned in clause
314	5.5.16.7.	Not Used.	-	Kindly refer to Corrigendum/Addendum, Item No 145
315	5.5.16.9.	The recordings and call logs for each of the Corridor shall be separate and contained within their own dedicated databases.	Does this means OCC and BCC are the separate corridors? If not please advise what separate Corridor means? Does the recording only or also the search and replay application needs to be separate?	Corridors are explained above under response to clause 5.1.2.3 . Recording and call logs to be recorded corridor wise separately.
316	5.5.16.10.	The software operating system and recording system applications shall be on separate recording media.	Does the OS and the recording software need to be on separate HDD or they can share the RAID-1 array?	Bidder is required to comply with the requirement given in the TS 5.5.16.11
317	5.5.16.12	Mechanical locking facilities shall be provided to prevent unauthorized access to the recorders.	Please clarify the Mechanical locking facilities	Archiver to be housed in mechanical locable cabinet.
318	5.5.17	Recording of Voice Channels All calls on telephones provided in: a. Stations and Station Control Room / SCO to and from DLC of OCC.	"Please clarify SCO Room? Where the SCO room located?" How many operation staff /area to cover under free space recording.	SCO to be read as Station Control Room
319	5.5.17.	Recording of Voice Channels	This requirement states SCO are to be recorded but the general requierment state only in OCC and BCC. Please advise	The Functional requirement is self explanatory in 5.5.17 whereas Recording extension shall be finalized during the design stage.
320	5.5.17.b	All calls on telephones provided in:		There is no query/suggestion from bidder
	5.5.17.b(i)	(i) Stations and Station Control Room / SCO to and from DLC of OCC.		
321	5.5.17.b(ii)	(iv) Help Points	Help point are not defined in the BOQ and also their interface is not defined, please advise	Help Points shall be part of scope of Telephone system, each platform will have one help points
322	5.5.17.e	Recording of free space voice conversations of all Controllers in SCO Room, DCC Room, and OCC Theatre. The micro phones shall be so placed in SCO, DCC, OCC to enable clear recording of all controller positions without any mixing / disturbance.	Recording of free space voice: It is stated that recording should be done in SCO but the general requierment states OCC and BCC only. Please advise. Please clarify if recording of ambient conversation is required?If so, what is the room size? Can a recorder be placed in each SCR or it should be recorded in OCC/BCC?	Recording of free space voice conversations of all Controllers in SCO Room(station Control room), DCC Room, and OCC Theatre. Architectural drawing of OCC will be made available. Recorder shall be preferabbly placed in CER/TER
323	5.6.1.1.3	New Clause added	-	Kindly refer to Corrigendum/Addendum, Item No 146
PART II, Section VII-B, Works Requirements Technical Specifications, Chapter 6 (TETRA Radio)				
324	Nil	Safety Related with Metro Rail communication for TETRA Radio Core	In order to ensure safety related with Metro Rail communication system, the TETRA OEM shall furnish certificate for TETRA Radio core Software meeting EN 50128 requirements for safety related rail communications systems.	Kindly refer to para 6.2 of chapter VII A of Part 2
325	Nil	TETRA	Please provide the location coordinates of the all the stations, OCC, Depot along with the track layout for accurate RF coverage simulation analysis.	RF Simulation coverage analysis to be performed during the design phase .
326	6.1.2.7	The radio system shall be designed to have suitable interfaces for integrating with other related subsystems as specified elsewhere in this TS	-	Kindly refer to Corrigendum/Addendum, Item No 147
327	6.3.1.1	The TETRA Central Radio Subsystem shall support and manage a number of Base Stations which shall be at least 20% in excess of the number (to the nearest whole number) required to achieve the functionalit y and performance as stated herein.The Radio System working requirement for NITL01 is follows:-1. The Bidder can suppl y a circuit switch based system or an IP based TETRA Accredited System. The system can have a centralised architecture or a distributed architecture. However , the System Response times as laid down vide	1. In case of RF there may be slight portion were signal strength may be less or no may be less than 2% out of 100. So area without any blank spot or drop of strength in case of RF coverage is difficult. We suggest to replace it will minimum drop. There are various environmental factors which affect the RF signal strength which cannot be predicted. 2. Generally the installation of Train Radio is responsibility of Rolling stock contractor and supervision of installation of 1-2 trains is done by COM contractor and comissioning complete by COM contractor. So it is suggested to keep installation of train radio in scope of RS only. 3. Regarding duplication of system what is expected here. Critical components are given as redudant for continous voice operation.	1. No change. Bidder request declined. Provision of tender clause will prevail. 2. Instaltion of train born equipment to be done by Rolling stock contractor if equipments is installed in factory . Contractor shall be responsible for timely delivery of all train born equipment , cables , conectors and accessories as per schedule . All necessary interface with rolling stock and cost to be born by NITL01 Contractor . 3. Functional and design requirement to be adhere as mentioned in the TS 4. Kindly refer to Corrigendum/Addendum, Item No 148

PART A Pre Bid Minutes

328	6.3.2.1	The Radio system shall include, but not be limited to, the following: (5) Radio control workstations and associated hardware (6) Radio dispatch workstations (RDW) and associated audio and signalling control hardware 1) Radio Control Workstation - Dispatcher (RCW) - The RCW shall have full dispatcher facilities for Controllers through the use of feature rich GUI.	We understand that Radio Control Workstation (RCW) and RDW are same. Kindly confirm.	Contractor to provision equipment which adhere functionality of Radio Dispatcher and Control Work station .
329	6.3.2.1.1	Central or Distributed Infrastructure control equipment including controller, switch , Recorder, Dispatchers, router, etc for OCC with a full backup of critical infrastructure at designated location which shall be specified later	What is the specification of full backup of critical infrastructure“. Is it simply the ability to backup the configuration in order to be able to restore the system at a later point of time or is full duplication of the infrastructure with switchover requested? Kindly elaborate this clause.	It is clarified that full back up of OCC is to be provided at BCC
330	6.3.2.1(20)	System should support end to end encryption or any other requirement for fulfilling Tetra Specification	-	Kindly refer to Corrigendum/Addendum, Item No 149
331	6.3.2.2	The scope of supply shall include all necessary hardware, software, firmware, accessories, materials and documentation. The detailed requirements shall be as given above in (This chapter) of Technical Specifications. In addition, N1TL01 to please note that Appendix J of Annexure gives the minimum BOQ to be covered as part of the scope of work and any other item or enhancement of the listed items required to complete the deliverables of N1TL01 Contract shall also be provided as part of this Design & Build lump sum Contract without any additional cost to the client.	Based on initial study carried out by us the minimum number of Base Station required to cover E-W and N-S corridor is 12. Request you to update the minimum BoQ accordingly with respect to BTS and other TETRA equipments mentioned in the minimum BoQ. Also please confirm if the minimum BoQ quantity for Radio units need to be considered as mentioned under Annexure A: Provisional Bill of Quantity.	Minimum BOQ modified. Kindly refer to Corrigendum/Addendum, Item No 31
332	6.3.3.4	The Contractor shall liaise with all concerned authorities including DoT, WPC, SACFA, civil Aviation authorities and other local authorities and obtain necessaryclearances/sanctions for installation and commissioning of the Radio system. All costs therein have to be borne by the Contractor, excluding the cost of Application and the annual frequency usage charges.	Please confirm whether all Statutory payment towards obtaining WPC clearance, ROW permission or any other licenses required for implementation / operation of this project shall be borne by Customer. We understand from this clause that only liaisoning cost is to be borne by N1TL01 contractor and all other costs like Application fee, license fee, Bank Guarantee, Royalty, cost of frequency pairs etc. will be borne by NMRCL. Kindly confirm.	TS clause is self explanatory, Liaising and interface with authorities to be done by N1TL01 . Where cost to be born by NMRCL as mentioned in the Clause. Kindly refer to Corrigendum/Addendum, Item No 150
333	6.4.2.1	Reliability Requirements Base Station Site > 30,0000 hours	We understand that it is a typo. Kindly clarify	Kindly refer to Corrigendum/Addendum, Item No 151
334	6.4.6 (vi)	Interoperability Requirements	In order to ensure that the Radio system has demonstrated working radio interoperability tests between radio equipment and the equipment of another radio vendor, it is advisable to support this with valid IOP certificate for the following feature. 1) Intersystem interface for ISI Group Call(or else Mobility Management), ISI Individual Call and Individually addressed ISI SDS. We kindly request you to add this requirement.	Kindly refer to Corrigendum/Addendum, Item No 152
335	6.4.9.2	The Contractor/Supplier of the Contractor shall be a TETRA Accredited manufacturer of TETRA Switching Infrastructure equipment (the base station can be integrated as an OEM partnerships) and shall have Inter-Operability Certificates issued by TETRA Accredited Test House. Copy of current and valid IOP certificate has to be submitted. The Certification shall cover all features as listed above in Clause 4.6, as a minimum.	Kindly confirm that the supply of TETRA switching Infrastructure, Base Station and Subscriber radios should be from a single OEM.	Bidders understanding is correct

PART A Pre Bid Minutes

336	6.5.1.2	The Radio system shall support both voice and data communications. The bit rate shall be up to 7.2 KBPS per time slot for data communication as a minimum. Either Multi slot should be provided to allow user to use as a minimum 2 time slots(which can be user defined to be any of the available time slots in BR) simultaneously in each carrier or NITL01 system shall be up-gradable to support higher data rates as per TETRA2 TEDS service by only software upgrades or upgradable to support broadband services by adding broadband base station based on Wimax or LTE technology on the proposed infrastructure.	Is support of multi slot packet data really requested? Please note that MSDP can only use semi-duplex data transmission. Single slot packet data on the other hand uses duplex. Besides the fact that MSPD wastes radio resources, semi-duplex mode has in practice the following negative impact: Call setup times as requested in clause 6.6.4.3, cannot be fulfilled on terminals transmitting MSPD, because the terminal is not continuously listening to all signalling in downlink. As a result an MSPD terminal may join a call too late, or even miss it completely. Thus, MSPD is potentially dangerous in mission critical environment. Our recommendation is that MSPD must never be used in communications systems for mission critical voice.	Bidder request declined. Provision of tender clause will prevail.
337	6.5.1.5	The CER in OCC shall be equipped with all control and monitoring equipment. The central control system shall be fault tolerant, and in a hot -standby configuration at OCC or based on a distributed architecture with full redundancy	In case of Radio MSO, redundancy of critical components for continous voice and data operation is given to continue operation in automatic way. Geographical redundancy of Central Radio system is suggested for automatic switchover for Auto to manual. We suggest to replace the full redundancy architecture will critical component redundancy to maintain voice operation	Bidder request declined. Provision of tender clause will prevail.
338	6.5.1.6	Antenna network comprising of leaky coaxial cable (only in case the antennae coverage is not there) shall enable radio coverage throughout the network. The contractor shall submit the details of network design and the locations of radio base stations sites and Antenna and leaky coaxial system necessary to provide the specified area coverage throughout the NMRCL network indicating full indoor coverage.	As the entire route is above ground and tunnel/UG stretch is not present, Leaky cable would not be applicable, hence request you to remove leaky cable from the specification.	provision of 100 % coverage to the metro locations is Contractor's responsibility . In case of provision of coverage in side the technical room or ground floor or inside the buiding is low , leaky cable or repeaters may need to be used . Kindly refer to Corrigendum/Addendum, Item No 153
339	6.5.2.2	The Radio System shall cover, but not be limited to: 2) all station plant room areas, subway entrances, including passenger entrances at ground level	This clause mentions about subway entrances. Kindly confirm if there are subway entrances and at which all locations.	Sub way entries are planned at AT grade stations Khapari & New Airport ,stations .
340	6.5.3.4.4	One RCW with restricted access shall also be located in the Central Equipment Room for Telecommunication Systems at OCC. This unit shall be used for maintenance monitoring and shall work as spares for RCWs in the OCC.	Please clarify the total quantity of RCWs required. As per MMI provision schedule Appendix - H, it is 10 however, considering OCC CER these are 11.	BOQ Modified. Kindly refer to Corrigendum/Addendum, Item No 31
341	6.5.4.1.6.1	DMO voice calls shall be possible both ways between the train-borne mobile and another train-borne mobile, train-borne mobile and hand-portable and between hand-portables located within a radius of 1 Km in above ground areas and practically feasible range in tunnels.	We understand that the entire corridor is elevated and there are no tunnels. Kindly confirm.	There is no tunnel, however coveragre shall include subway & indoor location inside the building
342	6.5.6.4.1	The system shall support multi-party voice communications between upto six different parties. The call shall be half-duplex and shall be authorised by RCW	Does this functionality refer to TETRA DGNA, dynamic group number allocation? See also clause 6.5.6.12.	Bidders understanding is correct
343	6.5.6.15.2.2	The data communication shall be supported by Short-Data Service and by Packet Data Gateway.		There is no query/suggestion from bidder
344	6.5.6.15.2.6	The system shall support Dedicated Data Channels This shall be achieved by dedicating specific traffic channels to only handle data. Each Base Site shall be able to accommodate up to four of these dedicated Packet Data Channels (PDCHs).	What is the reason for static allocation of data channels? From capacity point of view this is extremely inefficient. For example a base station with 2 carriers has 7 traffic channels. If 4 of these channels are reserved for data, then only 3 are available for voice - even if no data is transmitted. Our recommendation is that the same channel pool shall serve voice and data. As example, if the same base station has no data calls to serve, it will offer 7 channels for voice calls. In case of congestions, priority rules shall define, whether voice or data calls shall be served first.	Kindly refer to Corrigendum/Addendum, Item No 154
345	6.5.6.24	Requested Sites The system shall support Requested Sites which is a TETRA supplementary service that supplements the Group Call Service:	There is no such supplementary service in the TETRA standard, please explain the requirement.	The site supports a group call service allowing a user to communicate with any other users currently affiliated to the group and registered at that site. This is a half-duplex, clear speech service
346	6.5.7.2.5.3	In the RCW screen window, scroll bar shall be displayed with visual and audible alert showing detail of the Train ID, location from which the emergency call was originated. The Controller shall be informed if the call is a non ATP/ATO operation during revenue service.	-	Kindly refer to Corrigendum/Addendum 3, Item No 155

PART A Pre Bid Minutes

347	6.5.8.1.2	For the Rolling Stock being procured, Contractor shall have to coordinate for the physical dimensions, positions, mounting holes , antenna type, cable routes, cable lengths, cable/pin connections to Rolling Stock PA/TIMS and Signalling ATC/ATS systems protocols, exact data to be exchanged, etc. All costs, including design identification and implementation cost, shall be borne by NITL01.	Pin connector for interface with RS PA/TIMS, ATC on our side generally we provide. But cable for external interface and connectors on other side should be in RS or signalling scope as per there requirement. All the cables/conenctors within Train radio COM contractor provides. We request to modify the responsibilty matrix for supply	Tantative requirement is given, Contractor shall be responsible for desgin & interface with rolling stock & signalling contractor
348	6.6.3.2	A total of 5 (Five) frequency pairs are likely to be allotted for use by the metro. T .In case more frequencies are required as per the design of the Contractor, then these have to be arranged by him totall y at his cost and without time implications to the Employer.This cost shall include pay ment of annual fees also for these additional frequencies upto end of DLP period. The frequencies which may be allotted are in the band 380-400 MHz	Initially DOT will a lot 5 frequency pair but this is not sufficient to maintain seamless operation. Although frequency re using will be done but still minimum 10 pairs will be required for operation. So 10 frequency as minimum should be considered here. It is physically impossible to build a TETRA network with only 5 carriers, taking into account clause 6.2.3 (base stations are equipped with 2 and 4 carriers). The actual frequency re-use will depend mainly on how many of the base stations serve over- or underground areas. Hence, we kindly request to consider a more appropriate number of frequency pairs As per Nagpur metro route plan more than 8-9 base stations may be required, and as per clause 6.2.3 of TETRA Radio system, OCC alone require 4 pairs of frequencies. With the help of best possible re-use of frequencies 5 pairs of frequencies will not be sufficient in any case. Kindly advise.	Kindly refer to Corrigendum/Addendum, Item No156
349	6.6.5.1.4	For the Infrastructure switching equipment, changeover between main and hot standby shall occur with mini mum interruption to the call processing, so that an on-going call is not dropped in any case.	During failure there will be Auto switchover between Active to Stand by however there will be some configuration and software download within Central system due to which call drop may be there for minimum time.	Bidder request declined. Provision of tender clause will prevail.
350	6.6.7.1.10	All OCC controller activities shall be logged for audit trails indicating action, result, timing and responsibilit y. The logs shall be maintained in the NMS for extended periods and can be archived subsequentl y. The NMS shall provide a utilit y for log inspection and search operation in single or multiple module failures	OCC Controller activities is logged into RCW Server as all OCC control control activities will be monitored in CAD. So logs will be available in RCW server. NMS will provide alarms and other information like calls, channel assignment etc.	Bidder request declined. Provision of tender clause will prevail.
351	6.6.7.5.4	The RCW shall display all Radio Base Stations current status when requested and to display high level alarms when faults are detected in the Radio Communication System by the radio NMS.	RCW is generally responsible for controlling and monitoring of train radio communication. The status of Base stations can be seen in Radio NMS with complete detail of alarms.	Bidder request declined. Provision of tender clause will prevail.
352	6.6.10.2.12	The Base Stations shall be able to work in Wide Area and also in Local Site Trunking Mode with or without GPS. The Base Stations shall be provided with dual GPS for synchronisation. In case of failure of one GPS, the Base Station shall automatically switch over to the other GPS through the site controller. In case of failure of even the second GPS, the Base Station shall immediately send an alarm to Central NMS but the Base Station shall continue to work in Wide Area for at least 20 days without synchronisation problems for wide area calls.	In our experience, we have demosntrated that base station works synchronised for several years (min 2) without GPS. Hence we feel there is no need for a dual GPS as there is sufficient time to change a faulty GPS in time. Pl confirm if this can be considered	Bidder request declined. Provision of tender clause will prevail.
353	6.6.10.9.1.7	The antenna network shall be designed for the propagation of wide band radio signals optimally in the frequency ranges 380-400 MHz for Nagpur Metro Rail Project Phase-I Operations and for Radio/Fire Analog Radio Systems	As the coverage for outdoor and above ground areas will be taken care by the existing Radio System and Fire systems existing wireless communication infrastructure, this is not required for the Above ground system. We kindly request you to confirm the same.	NITL01 to make necessary survey to provide coverage to All Nagpur Metro Sites, nearest Police Stations near the stations & Fire Service Station near by the Metro Corridor .
354	6.6.11.1.9	The Contractor shall provide a complete radio control system including all the interfacing software and hardware for the interface with the cab simulator computer.	A complete radio control system requirement is not clear. Kindly clarify what all radio equipments need to be supplied for interface with cab simulator computer.	Bidder request declined. Provision of tender clause will prevail.
355	6.6.12.4.1(15)	(15) Maximum Data Rate : 7.2 Kbps per slot (28.8 Kbps with 4 Time slots)		Bidder have not given any query/suggestion

PART A Pre Bid Minutes

356	6.6.15.20	Land space of only 8m x 8m shall be made available for erection of Radio Antenna Towers at tentative station locations including the Depot. . At some locations, only 3m X 3m space shall be available and accordingly foundation has to be designed to take the load of the Tower under worst case wind conditions.	Kindly advise the locations where 8m x 8m and 3m x 3m space is available for erection of Radio tower. In addition, please advise if the Radio tower can be installed at roof top of station buildings is acceptable.	This is part of interface & detailed desgin, roof top solution will be acceptable if feasible.
357	6.7.1.3.1	The Radio system shall interface with the Telephone system to permit selected Handportable radios to initiate radio-to-telephone calls and vice versa without the intervention OCC and also for Radio to PAS call through EPABX link.	Kindly confirm that TETRA switching Infrastructure and EPABX would be interfaced using SIP over IP protocol.	Bidders understanding is correct
358	6.6.10.4.5 & Annx A			Kindly refer to Corrigendum/Addendum, Item No 157
Part II Section VII-B, Works Requirements Technical Specifications (Telephone Comm.)				
359	7.1.2	Overview of Telephone System The Telephone System shall provide the NMRCL staff with voice, fax and data communications between NMRCL personnel internally and also externally to the PSTN on IP PBX Exchange. Objective is to use the network infrastructure which is redundant. The same infrastructure shall be used on a separate CAT6 / CAT 7 for Voice / Video application on IP-PBX. In addition to IP-PBX and DLT telephones, help points shall also be provided for passengers for assistance when they are within the concourses, platforms and elevators inside the stations.	We understand the requirement is for redundant IP PBX system with Direct line telephone and Voice over IP phone system.	Scope of work is clearly defined in TS
360	7.1.2.1.1	It shall be a highly reliable State of the art, non-blocking, ISDN compatible IP PBX Telephone network for voice, facsimile and data communication services throughout the Nagpur Metro Rail Project Phase-I Metro Corridor. Telephone sets (where applicable) shall be provided in the control rooms, offices, administration offices, rooms for operation, maintenance, security and equipment rooms, staff rooms in the OCC & BCC, depot, TSS/RSS and all stations. Each OCC & BCC controller position shall also be provided with IP PBX telephones.	How many station, OCCs, BCCs, depot and RSS locations? Also we want to know that each locations like stations, OCCs, BCCs, depot are required in independent system in hot-standby redundancy? Kindly confirm	(1) Kindly refer to Corrigendum/Addendum, Item No, 74 wherein details are enclosed. (2) Kindly refer clause No7.5.1.1.1 wherein detailed topology explained. (3) HQ will be at Metro Bhavan which will also house BCC.
			How many station, OCCs, BCCs, depot and RSS locations? Also we want to know that each locations like stations, OCCs, BCCs, depot are required independent system in hot-standby redundancy? Kindly confirm. Please also confirm that will there be separate HQ.	
			Please provide no. of RSS & TSS locations and share drawings. Also kindly confirm level of redundancy required.	
361	7.1.2.2.1(4)	Not Used.	-	Kindly refer to Corrigendum/Addendum, Item No 158
362	7.1.2.5.2	The Telephone System shall be interfaced with a Centralised Digital Recording System for recording of free space voice conversations of all Controllers in SCO Room, DCC Room, and OCC Theatre. The micro phones shall be so placed in SCO, DCC, OCC to enable clear recording of all controller positions without any mixing / disturbance.	What is SCO Room? Where the SCO room located?	It is typo error SCR (station Control Room)
363	7.1.2.6.1	The Telephone Network Management System (NMS) main at OCC and redundant at BCC with Maintenance Supervisory Console, Keyboard and Log Printer shall be provided by N1TL01 Contractor. Bidder may also propose Virtualized solution by having all services applications, Database, Management servers including other system applications in Virtualized manner to optimize the solution hardware etc as per bidder design. In such case Subsystem/system redundant software shall be residing in separate server other than primary application server which should work in Hot standby mode.	-	Kindly refer to Corrigendum/Addendum, Item No 159
364	7.3.2.1	IP PBX Network	(1) Kindly confirm , as we understand Independent hotstandby IP pbx required at each station, HQ and Depot, OCC & BCC. For operation and admin users requirements.	TS requirement are very clear. Kindly refer to para 7.5.1.1.1
			(2) Kindly confirm , as we understand Independent hot standby IP PBX required at each station, HQ and Depot/OCC.	
365	7.3.2.1 (3)	(3) Basic Telephone sets	As we understand this is an analog telephone but specification of the same is not provided. Request you to provide the same	Kindly refer to Corrigendum/Addendum, Item No 164

PART A Pre Bid Minutes

366	7.3.2.2	Direct Line Telephone Communication	As we understand this shall be part of the IP PBX network clause 7.3.2.1. There is no need to provide the separate EPABX for this functionality. But the interface cards kept separate to make logical separation. Kindly confirm.	Under clause 7.1.1.4 option of end to end IP solution is also given, Bidder shall propose the solution accordingly.
367	7.3.2.3	IP PBX Phones (1) Automatic exchange/processor unit with line and trunk interfaces. (2) Gateways for interface between the LAN and switched circuit network	(1) Word Phones to be removed(Typo Error)	Kindly refer to Corrigendum/Addendum, Item No 160
			(2) We understand that Independent hot standby IP PBX is to be deployed centrally at Depot/OCC and IP & Video phones at station level. Please confirm.	(1).Video phone not required.(2) TS requirement are very clear. Kindly refer to para 7.5.1.1.1
			(3) Kindly confirm as we understand this is Independent hot standby IP PBX deploy centrally at Depot/OCC and at station level we have to deploy the IP and Video Phones and UMA clients only.	
368	7.3.2.4	Network Management system.” Bidder may also propose a Virtualized solution by having all services applications, Database, Management servers including other system applications in Virtualized manner to optimize the solution hardware	NMRL to clarify this virtualisation concept is applicable only to NMS or even for the call server / IP PBX also.	It is clarified that virtualisation is only applicable to NMS
369	7.5.1.1.1	There is one main node at OCC/BCC. The main node shall be connected with ETHERNET links to the Telephone Exchanges at individual stations. The ETHERNET Links should form a ring with not more than 4 station exchanges in each ETHERNET ring as further explained in next Para. The interconnection plan should be designed and approval taken from employer. The NITL01 Contractor shall provide necessary ETHERNET Link port cards in his system and all required materials for ETHERNET connectivity between exchanges. Further details shall be as given in Clause 5.3 below. The IP PBX’s shall be installed in TER at all locations. The IP PBX switches shall be connected to each other through ethernet links of the FOTS to form the IP PBX switch network. The ethernet channels shall be provided by FOTS on a DDF in the TER.	(1)The Network topology in IP-PBX is to follow the FOTS ETHERNET topology is the best way in IP-PBX technology. Because the one IP-PBX connect to Other IP-PBX through FOTS is on logical link and follow the RTP between the various IP-PBXs to avoid the uses of IP resources in multihop calls. request you to amend the same. Here the FOTS is the DTS system, where the Ethernet ring is made on L3 switches so there is no way to get the ETHERNET channels on DDF, request you to make necessary changes in point of view with Ethernet over L3 switches.	FOTS channel to be terminated in DDF, whereas topology of IPBX will be as per clause. Details will be finalised during design stage.
			(2)We proposed to follow the Network topology in IP-PBX is to follow the FOTS ETHERNET topology. IP-PBX will be connect to Other IP-PBX through FOTS is on logical link. Request you to amend the same.	
370	7.5.1.1.2	Requirements of IP PBX Telephone System are given in Table 5-1 below. Table 5-1: IP PBX Telephone System Requirements	(1) There is additionally BCC and 2 nos. Depot are there, the same is not reflecting in BOQ table 5.1 and in price sheet PART- I, Bidding Procedure - Annexure- IV (Bidders Technical Proposal) page no. 10, 3. BOQ of Telephone & DC Power Supply System-Schedule J. Kindly add the same.	(1) Min BOQ given in price schedule,Kindly refer to Corrigendum/Addendum , Item No 31, (2) clause .7.5.1.1.2 deleted, Kindly refer to Corrigendum/Addendum, Item No 161
			(2) Please clarify the following quantity: 1) Item No: 3 Basic Telephone quantity required will be 1122, whereas in the BOQ Sr No-8 Basic Phones quantity is 900. 2) Item No:4 Digital Phones quantity required will be 342 whereas in the BOQ Sr No-9 Digital Feature Phones quantity is 46.	Anomaly corrected. Kindly refer to Corrigendum/Addendum, Item No 31
			1) What is type of basic telephone? Please confirm if Analogue phone? 2) If YES, please provide the specifications for same.	Specification of basic phone enclosed, Kindly refer to Corrigendum/Addendum, Item No 164
			Wired Ports including License therein	We understand the wired ports qty includes the IP phone licenses, analog phone licenses and digital phone licenses. Kindly confirm.
371	7.5.1.1.9	Network Features – Automatic Call Back	Feature explanation is incomplete.(typo Error)	kindly see corrigendum/addendum item No162
372	7.5.1.1.10.2	Digital trunks at ETHERNET level from FOTS (shall be used as tie lines between IP PBX switches. Common channel signaling conforming to ITU-T recommendations I.431 and I.441 shall be supported. The frame structure shall contain voice, data, synchronization and signalling channels.	This clause is applicable for the PRI ISDN case not for the Ethernet IP trunk. Request you to make the necessary changes as the IP trunking between the various IP PABXs.And In IP trunking there is no common channels signaling. It is packet switching.	Kindly refer to clause 7.1.1.4 wherein bidder may also propose end to end IP solution, Bidder shall propose the solution accordingly.

PART A Pre Bid Minutes

373	7.5.1.1.10.3	The IP PBX shall provide analogue and digital subscriber line cards to support analogue and digital telephone sets	(1)This is a TDM feature . In case complete IP solution the same should not be applicable Request you to remove this feature .	Kindly refer to clause 7.1.1.4 wherein bidder may also propose end to end IP solution, Bidder shall propose the solution accordingly.
			(2)This is a TDM feature . Request you to remove this feature as it is not applicable for IP PBX / gateway (In case NMRL wishes to have this feature it is possible to have this thro external device only for Analog extensions)	
			(3)We request you to kindly make the basic IP phone as basic analog phone, because to have high availability at 99.99% where all the time dependency is on LAN switches. If one Lan switch is failed then several IP phones shall be out of order. In analog telephone there will be failure on port level, it means only one phone will fail and possibility for the same is very remote.	
374	7.5.1.1.12.1	Basic IP Phone : -Min 20 memory keys with 10 Keys for speed dialling and 10 Keys for system features	Normally basic IP phones comes with 6 keys as otherwise the same goes in advance category .Request you to reduce this no to 6 Programmable keys with Min 3 page button options.	Kindly refer to corrigendum/addendum item no163
			Request you to reduce this no to 6 Programmable keys with Min 3 page button options (Normally we need to give high end phone with add on modules to meet the tender specification.)	
			Request you to reduce this no to 6 Programmable keys with Min 3 page button options	
			We request you to kindly make the basic IP phone as basic analog phone, because to have high availability at 99.99% where all the time dependency is on LAN switches. If one Lan switch is failed then several IP phones shall be out of order. In analog telephone there will be failure on port level, it means only one phone will fail and possibility for the same is very remote.	Bidder request declined. Provision of tender clause will prevail.
375	7.5.1.1.12.2	Not Used.	-	Kindly refer to Corrigendum/Addendum , Item No 164
376	7.5.1.1.12.3 (7)	Basic IP telephone - (7) A minimum of 20 memory keys with 10 keys for speed dialing and 10 keys for programmable system features which shall include but not be limited to, call pickup, call forward, call back, system speed dial, call park, direct pickup, cancel call forward, cancel call back, personal speed dial and one spare key;	We request you to consider removing this clause, where this specifies a high end IP/ analog phone, where only a a basic phoneis required.s.	Bidder request declined. Provision of tender clause will prevail.
377	7.5.1.1.12.3 (9)	Digital Feature Telephone- Sr.no 9 – Dial by Name – Dictionary	Request you to change it as “Directory” (typo Error)	Kindly refer to corrigendum/addendum item no 165
378	7.5.1.1.12.3 (13)	Digital Feature Telephone- Sr.no 13 – Programmable Multiline operations	(1)Request you to remove this feature as it is specific to one particular system.	Kindly refer to clause 7.1.1.4 wherein bidder may also propose end to end IP solution, Bidder shall propose the solution accordingly.
			(2) Request you to remove this feature as it is specific to one particular make & is not a generalised feature.	
379	7.5.2.1.1(4)	Direct Line CommunicationSystem – General. Between OCC and other locations like State Electricity Board Control Room, RSSs, TSS, Stations, Depot and Security Control Room through leased telephone line of PSTN (MTNL/BSNL/Private Operator	Does NMRL wants to connect RSS, TSS locations thro’ leased line ???	Kindly refer to corrigendum/addendum item No 166
380	7.5.2.1.2	The Direct Line Communication system shall be logically independent of the IP PBX network on the NMRCL network	(1)We shall use single PBX system with common control cards / server with logical partition for Direct line communications. However we shall use separate set of interface cards for Direct line operations . Is that Ok ?	Kindly refer to clause 7.1.1.4 wherein bidder may also propose end to end IP solution, Bidder shall propose the solution accordingly.

PART A Pre Bid Minutes

			(2)Direct Line Communication network shall have separate extension cards, But the network link shall be common in VOIP technology. The IP link between the two IP-PBX system is a logical link and work in ring/ mesh topology with RTP. There is no way for the same route has two different call segregation as PBX & DLT. However the Direct line communication will be assigned with high priority and can made more reliable and always made available by having a top priority of calls made by the direct line sets in local as well as in network during emergencies even in case the Direct Line Communication does not work or is overloaded. Also in IP technology the IP trunk hardware can be made minimum two for the high availability/ redundancy. We request you to provide the necessary amended as above.	Bidder request declined. Provision of tender clause will prevail.
381	7.5.2.1.3	The Direct Line Telephones At the locations other than the OCC, Direct Line Telephones shall be terminated on standard telephone sets.	Pls clarify the weather need to provide normal analog phones or digital phones. Where as per clause 7.5.2.3 we need to provide 10 lines which is possible thro Digital Phones or IP Phones.	Kindly see the corrigendum/addendum item No 167
382	7.5.2.1.4	The IP PBX Switch at each station shall also provide additionally Direct Line communication. But to make Direct Line Communication network more reliable and non-blocking, the IP PBX switch network shall be kept logically separated from this network. Direct Line Communication network shall have separate extension cards, its own separate network links and its own routes defined for establishing the communication. With this architecture, during emergencies when the Direct Line Communication does not work or is overloaded, the IP PBX network can be made available on demand for Direct Line communication.	Direct Line Communication network shall have separate extension cards, But the network link shall be common in VOIP technology. The IP link between the two IP-PBX system is a logical link and work in ring/ mesh topology with RTP. There is no way for the same route has two different call segregation as PBX & DLT. However the Direct line communication will be assigned with high priority and can made more reliable and always made available by having a top priority of calls made by the direct line sets in local as well as in network during emergencies even in case the Direct Line Communication does not work or is overloaded. Also in IP technology the IP trunk hardware can be made minimum two for the high availability/ redundancy. We request you to provide the necessary amended as above.	Bidder request declined. Provision of tender clause will prevail.
383	7.5.2.1.5	Direct Line Communication network shall use topology similar to the IP PBX for stations described above. The ETHERNET Links should form a ring with not more than 4 station exchanges in each ETHERNET ring as further explained in next Para. The interconnection plan should be designed and approval taken from employer. The IP PBX at OCC shall be the main central node The network shall have alternate call routing paths to make it totally non-blocking. Direct Line Telephone network with its exclusive ETHERNET rings as a minimum shall be provided. However to meet with the requirements of this contract and requirements of the Designated Project Contractors, additional equipment/services as required shall also be provided by .	(1)Direct Line Communication network shall have separate extension cards, But the network link shall be common in VOIP technology. The IP link between the two IP-PBX system is a logical link and work in ring/ mesh topology with RTP. There is no way for the same route has two different call segregation as PBX & DLT. However the Direct line communication will be assigned with high priority and can made more reliable and always made available by having a top priority of calls made by the direct line sets in local as well as in network during emergencies even in case the Direct Line Communication does not work or is overloaded. Also in IP technology the IP trunk hardware can be made minimum two for the high availability/ redundancy. We request you to provide the necessary amended as above.	Bidder request declined. Provision of tender clause will prevail.
			(2) We proposed to follow the Network topology in Direct Line Communication Network is to follow the FOTS ETHERNET topology. IP-PBX will be connect to Other IP-PBX through FOTS is on logical link. Request you to amend the same.	Kindly refer to clause 7.1.1.4 wherein bidder may also propose end to end IP solution, Bidder shall propose the solution accordingly.
384	7.5.2.2.5 (13)	New Clause added		Kindly refer to Corrigendum/Addendum, Item No168
385	7.5.2.3	Direct Line Telephones - Direct Line Telephones shall be standard Telephones connected to OCC Direct Line Console through single push button selection. In each station 1 Nos. of such telephones, 20 lines for SCR/DCC, and 10 lines for each of the other locations in the Stations/Depot/RSS shall be provided. It shall be possible for the SCR to make normal and emergency direct line calls to the designated controllers in OCC. Different audio/visual indications shall be provided for incoming direct line calls on the Direct Line Telephones for normal and emergency calls.	Kindly provide the tentative/ Minimum quantity for DLT 10 LINE Telephones at each station, OCC,depot and RSS locations.	Minimum qty difined in BOQ. Kindly refer to Corrigendum/Addendum, Item No 31
386	7.5.2.4	Help points IP phone	We request you to kindly make the Help Points IP phone as basic analog phone, because to have high availability at 99.99% where all the time dependency is on LAN switches. If one Lan switch is failed then several IP phones shall be out of order. In analog telephone there will be failure on port level, it means only one phone we be failed and possibility for the same is very remote.	Bidder request declined. Provision of tender clause will prevail.Kindly refer to clause 7.1.1.4 wherein bidder may also propose end to end IP solution, Bidder shall propose the solution accordingly.

PART A Pre Bid Minutes

387	7.5.3.1.1	VOICE OVER IP Switch network - IP PBX facility shall be provided at OCC, stations and depot. At OCC, the IP PBX facility shall support 10 voice phones + 4video phones. IP PBX shall provide facility for connecting to other exchange networks. For this, IP PBX shall provide Media Gateway with gatekeeper (1+1 redundant) to support PRI Trunks to connect exchanges in the NMRCL network in feature transparent manner (QSIG in heterogeneous environment). For connectivity to the IP PBX network 4 PRI trunks shall be made available as a minimum.	We request you to change 4 PRI to 120 IP Trunks as NMRL is looking for VoIP Based Network. Thus no need for Gatekeeper to avoid point of failures.	Kindly refer to clause 7.1.1.4 wherein bidder may also propose end to end IP solution, Bidder shall propose the solution accordingly.		
			Kindly confirm , as we understand this is Independent hotstandby IP PBX deploy centrally at OCC and at station level we have to deploy the IP and Video Phones and UMA clients only.	Kindly refer to Corrigendum/addendum Item No169. Network topology as defined in clause to be adopted.		
			Kindly confirm IP and Video Phones and UMA clients required to be deployed at each location.	Video phone deleted from scope.		
			Please provide the specifications for video phone			
388	7.5.3.1.2	Main Nodes IP PBX at OCC shall form the main node with backup at BCC at	Kindly provide the name of BCC location.	Initially OCC will be provided at Metro Bhavan, after construction of OCC at sitabuildi, OCC at Metro Bhavan will become BCC.		
389	7.5.3.1.4	Requirements of IP PBX System are given in Table 5-3 below as a minimum. #3 Call Server #4 Media Gateway with gatekeeper (1+1 redundant)	Normally for any redundancy 1+1 call server with Active – Active capability is sufficient . Please confirm back ? Request you to change this as 120 IP Trunks	Kindly refer to clause 7.1.1.4 wherein bidder may also propose end to end IP solution, Bidder shall propose the solution accordingly.		
		Requirements of IP PBX System are given in Table 5-3 below as a minimum. S. No. 5	Layer 2 switch quantity is 23 in SCHEDULE-J of BOQ of telephone system, where it has to be 25 nos.as per PS clause. Kindly confirm.	(1)Supply of switch deleted from the scope of Telephone & included in FOTS. Kindly refer to corrigendum/addendum Item No 170. (2) for BOQ Kindly refer to Corrigendum/Addendum, Item No 31		
		sl.no. 11 - Total no. of users (voice phones)	(1)Qty mention is 72 nos. where as it is required 118 nos. as per, document PART- I, Bidding Procedure - Annexure- IV (Bidders Technical Proposal) page no. 10, 3. BOQ of Telephone & DC Power Supply System- Schedule J, sl. no. 14 (2)Qty mention is 72 nos. where as it is required 118 nos. as per, document PART- I, Bidding Procedure - Annexure- IV (Bidders Technical Proposal) page no. 10, 3. BOQ of Telephone & DC Power Supply System- Schedule J, sl. no. 15	(1) Minimum BOQ modified,Kindly refer to Corrigendum/Addendum, Item No 31 (2) clause modified, Kindly refer to Corrigendum/Addendum, Item No 170		
		sl.no. 12 - Total no. of users (video phones)	(3)Qty mention is 34 nos. where as it is required 54 nos. as per, document PART- I, Bidding Procedure - Annexure- IV (Bidders Technical Proposal) page no. 10, 3. BOQ of Telephone & DC Power Supply System- Schedule J, sl. no. 13 (4)Qty mentioned in bid format is 34 nos. where as it is required is 54 nos. as per, document PART- I, Bidding Procedure - Annexure- IV (Bidders Technical Proposal) page no. 10, 3. BOQ of Telephone & DC Power Supply System- Schedule J, sl. no. 14			
		Bandwidth on Ethernet between Station/Depot and OCC. 5Mbps and 10 Mbps	do we need to provision point to point links/MPLS from ISP of 5Mbps between OCC and stations?? do we need to provision point to point links/MPLS from ISP of 10 Mbps between OCC and depots??	Point to point and /or point to multi point ethernet link to be provisioned as per network topology requirement of different systems		
		Bandwidth on Ethernet 150 Mbps at OCC	do we need to provision MPLS from ISP of 150 Mbps at OCC??	Yes this is Minimum requirement whereas detailed bandwidth and channel plan shall be part of detailed design		
		Media Gateway with gatekeeper (1+1 redundant - 4 PRI link	do we need to provide 4 PRI links from ISP at OCC?? Should these links from different ISPs? Pls clarify will these PRIs be used for only incoming or will it be used for outgoing calls also?? for the entire RFP, do we need to provide bandwidth from ISPs for any requirement ? Pls clarify. should we consider only the fixed rental charges in our proposal for the PRIs or only the one time setup cost? Hope monthly recurring costs for the PRIs would be paid on actuals by NMRCL. Pls clarify	Links from different ISP's shall be preferred Used for both incoming and outgoing Bandwidth Requirement shall be calculated by contractor and proposed for detailed design and approval Only fixed one time cost shall be considered by vendor. Rental shall be paid by NMRCL		
		390	7.5.3.1.5	Class of service	As features already asked under clause 5.1.1.9, 5.4.1, 5.4.2 and 5.4.3. Request you to remove the same where lots of terminology, which are not common as industry standard. And as well not applicable in Metro Rail Operations.	(1) Bidder request declined. Provision of tender clause will prevail. (2) Kindly refer to clause 7.1.1.4 wherein bidder may also propose end to end IP solution, Bidder shall propose the solution accordingly.
		391	7.5.3.1.5.1	Class of Service – Trunk / Tie	(1)As features already asked under clause 7.5.1.1.9, 7.5.1.1.9.1,7.5.1.1.9.2, 7.5.4.1, 7.5.4.2 and 7.5.4.3. Also Request you to remove the same where lots of terminology, which are not common as industry standard. And as well not applicable in Metro Rail Operations.	

PART A Pre Bid Minutes

			(2)As features already asked under clause 5.1.1.9, 5.4.1, 5.4.2 and 5.4.3. Request you to remove the same where lots of terminology, which are not common as industry standard. And as well not applicable in Metro Rail Operations.	
392	7.5.3.1.5.2	Class of Service – Ext / Ext Restriction	As features already asked under clause 7.5.1.1.9, 7.5.1.1.9.1,7.5.1.1.9.2, 7.5.4.1, 7.5.4.2 and 7.5.4.3. Also Request you to remove the same where lots of terminology, which are not common as industry standard. And as well not applicable in Metro Rail Operations.	(1) Bidder request declined. Provision of tender clause will prevail. (2) Kindly refer to clause 7.1.1.4 wherein bidder may also propose end to end IP solution, Bidder shall propose the solution accordingly.
			Please clarify : MCO, Forced ARS, OHVA , UNA pickup, BGM access & CFD setting	MCO - To be referred as PABX. ARS - Automatic Route Selector. CFD - Call Forwarding Dynamics BGM - Used for Modulation & Encoder
393	7.5.3.1.5.3	Class of Service – T1 Trunk Ring Back Service Tone , The system can be programmed to send a simulated ring back tone to T1 trunks when the CO does not provide a ring back tone.	Since we are not using the T1 trunk in INDIA, kindly request you to remove the clause.	Bidders request accepted. Kindly refer to Corrigendum/Addendum , Item No 171
394	7.5.3.1.5.4	Class of Service – Trunk to Trunk Restriction Trunk to Trunk COS allows or restricts call transfers from one trunk to another trunk based on the originating and receiving trunk COS.	As features already asked under clause 5.1.1.9, 5.4.1, 5.4.2 and 5.4.3. Request you to remove the same where lots of terminology, which are not common as industry standard. And as well not applicable in Metro Rail Operations.	Bidder request declined. Provision of tender clause will prevail.
395	7.5.3.1.5.5	Class of Service – Extension (Station) Timers	(1)We Request you to remove this as These parameters will be varying system to system. As per individual design of the system. (2)As features already asked under clause 7.5.1.1.9, 7.5.1.1.9.1,7.5.1.1.9.2, 7.5.4.1, 7.5.4.2 and 7.5.4.3. Also Request you to remove the same where lots of terminology, which are not common as industry standard. And as well not applicable in Metro Rail Operations. (3)As features already asked under clause 5.1.1.9, 5.4.1, 5.4.2 and 5.4.3. Request you to remove the same where lots of terminology, which are not common as industry standard. And as well not applicable in Metro Rail Operations.	(1) Bidder request declined. Provision of tender clause will prevail. (2) Kindly refer to clause 7.1.1.4 wherein bidder may also propose end to end IP solution, Bidder shall propose the solution accordingly.
396	7.5.3.1.6.3	Unified Messaging Application: The Audio and data collaboration should be with recording capabilities upto 50 hrs minimum.	Pls clarify whetherwe need to record only Audio Part or need “screen recording “ of Data collaboration terminals. ? Please confirm .	System is supposed to record only Audio Part . Video Phone has been removed .
397	7.5.3.1.6.7	IP PBX system shall have provision to support Video Conferencing between OCC and Stations to provide Continuous mode Video Conferencing thorough 3rd Party solution.	Please clarify what provisions are requested to support Video Conferencing?	This is part of detail desgin
398	7.5.3.1.12	IP PBX system shall provide 30 channels on SIP Trunk and 30 channels on H323 Trunk as minimum for high availability.	(1)Request you to remove H.323 trunks as these are proprietary to all the OEM’s and there is no interoperability of H.323 between various systems. To make it as 60 Nos as SIP trunk . (2) Request you to remove H.323 trunks as these are proprietary to all the OEM’s and there is no interoperability of H.323 between various systems. To make it as 60 Nos as SIP or H.323 trunk as applicable	Kindly refer to clause 7.1.1.4 wherein bidder may also propose end to end IP solution, Bidder shall propose the solution accordingly.
399	7.5.3.1.25	The Layer 3 Managed and Layer 2 Managed switches at OCC and Stations shall have the following specifications as a minimum (Table 5.4).	Please specify Table 5.4 into PS.	Provision of switch shifted in the scope of FOTS. Kindly refer to Corrigendum/addendum Item No 172
400	7.5.4.1.6	IP PBX Functionality - 7.5.4.1.6 A warning tone shall be provided to alert in the event of an extension being off-hook.	This is a TDM Feature and it is not applicable for all the systems. To make it generic to all the OEM’s request you to remove this facility. Status of such extensions shall be viewed in NMS / GUI of system.	Kindly refer to clause 7.1.1.4 wherein bidder may also propose end to end IP solution, Bidder shall propose the solution accordingly.
401	7.5.4.6.9.2	The IP PBX shall provide support for Video and Audio phone sets over H323 and SIP protocols. The system shall support the following as a minimum	We understand that MGCP is a vendor proprietary terminology. The SI maybe be allowed to give respective gateway control protocol for different vendors. Request you to change this as H.323 or SIP Protocols	Provision modified, Kindly refer to Corrigendum/addendum Item No 173

PART A Pre Bid Minutes

			As per the latest IP protocols SIP is a an open standard protocol as compared to proprietary H.323 standards. . Request you to change this as H.323 or SIP Protocols.	
402	Table 5.4	Specifications of Switches for IP PBX Network	-	Kindly refer to Corrigendum/Addendum , Item No 174
403	7.5.4.6.11.1	IP PBX Telephones		
404	7.6.10	New Clause added	-	Kindly refer to Corrigendum/Addendum , Item No 175
405	7.8.1.2.5	N1TL01 to provide the Ethernet links at TER/CER as per their IP PBX communication bandwidth requirements	do we need to provide MPLS bandwidth from ISPs for the IP PBX communication requirements?? Pls clarify	Bandwidth Requirement shall be calculated by contractor and proposed for detailed design and approval
406	7.8.1.2.6	In addition N1TL01 shall provide redundant links for IP PBX redundant Call Servers and switches at OCC.	do we need to provide redundant links from two different ISPs between OCC and stations/depots . Pls confirm??	Yes, Redundant Link shall be provided
407	7.8.1.2.7	Bandwidth requirement mentioned in table 5.3 above are taken as tentative. N1TL01 shall provide exact bandwidth as per requirement and shall interface for ultimate / exact bandwidth requirement (for IP PBX communication network) at OCC and each station in compliance of this Technical Specification for IP PBX communication.	do we need to procure the point to point links/MPLS links from ISP to cater this requirement?? Commercial format does not have any field to capture the links from ISPs for the same. Pls clarify	Point to point and /or point to multi point ethernet link to be provisioned as per network topology requirement of different systems
408	Annex-A	Provisional Bill of Quantity for Telephone System Units to be provided at various locations is as under:-	<p>1) Analog Telephone - As per annexure total quantity will be 1447, this is not matching with the Anaolg phone quantity mentioned in the BOQ Sr. No-8 and the Table 5-1 Item No-3. please clarify</p> <p>2) Digital Telephone - As per annexure total quantity will be 277, this is not matching with the Digital phone qunatity mentioned in the BOQ Sr. No-9 and the Table 5-1 Item No-4 , please clarify</p> <p>3) DLT Analog (Help-Point & Lift Intercom Phone) - Is the Help phone mentioned here is different than the clause 7.5.2.4. if it is same please confirm the type as IP or analog.</p> <p>4) DLT Console - DLT console qty is 9, whereas in the APPENDIX-H MMI schedule qty required is 15 and BOQ Sr. No-6 qty is 25 nos. please clarify.</p> <p>the annexure A on page 360 under chapter 7 is not matching with the price sheet and the PS capter 7 and table 5.1 under clause 7.5.1.1.2. Request you to kindly delete the same as the requirement under this not matching with PS chapter specifications.</p>	(1)Annexure A deleted. Kindly refer to Corrigendum/Addendum, Item No176. (2) Minimum BOQ defined in price schedule, Kindly refer to Corrigendum/Addendum, Item No 31
PART II, Section VII-B, Works Requirements Technical Specifications (CCTV)				
40	8.1.2.3	The CCTV system shall consist of the following principal sub systems:	-	Kindly refer to corrigendum/addendum No177
410	8.1.2.3, 8.5.2.1.4	1. Platform Surveillance – CCTV system for monitoring of entraining and detraining of passengers at all platforms of all stations of NMRCL. Unless specified otherwise elsewhere in the TS, cameras, field switches, PF Monitors and other equipments meant for outdoor installation, shall be suitable to work from 0 degree to +50 degree C with RH up to 80% non condensing.	PF Monitor and Decoder quantity are not mention in document. Please clarify wether it is required or not.	Scope of PF Monitor removed,
411	8.1.2.4	The station (including RSS, Parking, specifically identified theft prone track are as, signaling point crossing and ramps)	-	Kindly refer to corrigendum/addendum No 178
412	8.1.2.9	Layer – 3 network for Transmission of video from statuons, depot shall be provided by the N1TL01 contractor	-	Kindly refer to corrigendum/addendum No 179
413	8.1.2.1 0	Station entries, parkings, specifically identified theft prone track areas, signaling point crossings, RSS, ramps shall be covered by providing cameras with IR illuminator at the pole/wall keeping in view the lighting conditions.	<p>No. of parking locations is not metioned. Please clarify.</p> <p>No. of RAMP and its Location is not mentioned. Please provide.</p> <p>No. of Signal point crossing and its location is not mentioned. Please provide.</p> <p>Per station no. of entry and exit gate is not mentioned. Please provide.</p>	<p>Detailed mentioned in Part 2, Section VIIB, chapter 1.Kindly refer to Corrigendum/Addendum, Item No 74</p> <p>Signal point crossing deleted from scope., Kindly refer to corrigendum/addendum No 180</p> <p>Detailed mentioned in Part 2, Section VIIB, chapter 1.Kindly refer to Corrigendum/Addendum, Item No 74</p>

PART A Pre Bid Minutes

			Need details of stations with parking locations. Need details of no. of entry and exit gates. Need details of no. of TSS and RSS locations. Need details of no. of RAMP location. Need details of no. of Signal point crossing locations. No. of TSS and RSS location is not mentioned. Kindly provide	(1) Signal point crossing deleted from scope., Kindly refer to corrigendum/addendum No 180 (2) , kindly refer to corrigendum/addendum No 74 Detailed mentioned in Part 2, Section VIIB, chapter 1. Kindly refer to Corrigendum/Addendum , Item No 74
414	8.2.2.1	The scope of supply for the IP based CCTV system shall include, but not be limited to the following: CCTV Control Equipment at OCC/BCC, Stations, Depot and RSSs. Armoured Optical Fibre Cable minimum (12 fibres) to connect the cameras of stations, depots, RSS, parking, ramp, signal point crossing etc to the station TER. Tentative distance as an average between the RSSs / Ramp / Signal crossing and the stations / depots shall be within 1 km.	We could not find any other reference for the control equipment in RSS, please advice what shall be installed in RSS? Please clarify over the specification of 12 core fibre cable required for connectivity.	CCTV HMI with Joystick shall be installed in the RSS . Kindly refer to corrigendum/addendum No 181 Kindly refer to Clause number 2 of Appendix D in Part II section 12
414	8.2.2.2 (23)	Anti-virus and network security software for the CCTV system	We assume Anivirus and network security software both are same package. Please clarify. Please clarify what is meant by Network Security Software	These two are different in the sense where the application is as per design . If Network Security is related to Appliances , standard software then it lies in OSI layer 1-6 , where as Anti Virus can also be implemented in Application at OSI layer 7.
415	8.3.2.3	The contractor shall ensure that the CCTV system equipment's supplied under the contract shall comply with the reliability figures herein:	Video recorder equipment is combination of hardware /software/operating system etc... pl suggest how do we take MTBF here.. What is the way to calculate of verify MTBF	Contractor to submit calculation break up of calculation of hardware , software , OS while adhering MTBF requirement of TS. Kindly refer to corrigendum/addendum No 182
416	8.4.1.5	System shall use video signals from various types of indoor / outdoor IP cameras installed at	_	Kindly refer to corrigendum/addendum No 183
417	8.4.1.6	The video signal output of all the cameras in various locations at stations, OCC shall be fed to the TER at respective stations / OCC and through Ethernet switch network distribute these video signals to the following:	Kindly confirm how many stations are having PSB. We could not find PSB locations in Annexure B and Appendix R? The statement "Any other location to be decided by the employer's representative at the time of detailed design" is open which makes BoQ undefined and difficult for estimation. It is requested to include the identified location in this chapter.	Kindly refer to corrigendum/addendum No 184
418	8.4.1.8	The video signal output of all the cameras in various locations at the Depot shall be fed to the TER at Depot and through Ethernet switch network distribute these video signals to the following:	_	Kindly refer to corrigendum/addendum No 185
419	8.4.1.10	There shall be 4 x 1 gbps optical ports and 10 x 10 / 100 / 1000 base T ports available for CCTV system on each layer 3 switch at stations / depot and 24 x 10 / 100 / 1000 base T redundant ports will available as part of FOTS chapter at OCC / BCC for CCTV system. All the cameras in the stations / depot / OCC shall be connected to the layer 2 switches (as part of this contract) and no cameras will be directly connected to the layer 3 network.	The layer 3 switch will aggregate connectivity from field l2 switches. Since the L2 to L3 connectivity is optical, the L3 switch should have optical port density. With regards to L2 field switch, can we provide an 8 / 16 port switch as required? Also 10/100 Mbps speed is sufficient as cameras will have 100 Mbps port. Bidder assume that it is asked for Switch level redundancy not port leel redundancy	For uniformity scope of supply of switch shifted to FOTS, moreover to bring down the inventory only 24/48 port switch to be supplied. Kindly refer to corrigendum/addendum No 186 Bidders understanding is correct
420	8.4.1.11	The list of stations and depot to be provided with Video Surveillance System in NMRCL is given in Appendix C (Sections) of this PS Chapter 11.	PS chapter 11 is TELECOM SUPERVISORY CONTROL AND DATA ACQUISITION (T-SCADA). Kindly ammend the revised Appendix location in PS	Details given in Chapter 1 of TS, Kindly refer to Corrigendum/Addendum, Item No 74 & Kindly refer to corrigendum/addendum No 187
421	8.4.2.1	4.2.1 The station CCTV surveillance system shall provide 100% coverage of the following specific areas at all stations as a minimum: (10) subways;	Kindly confirm if there is any subway location in the NMRCL corridor. for Entry & Exit monitoring, We assume cameras to be installed inside the station areas . Outside coverage is only through the cameras installed inside the building facing outside. quantity of CCTV Camera are defined in the tender.. We are not aware if those camera are enough to cover 100% coverage. To covered 100% coverage in specified location.. We may need to increase number of camera.. Kindly suggest way forward	Sub way location shall be there at 02 number At grade stations. Details given in Chapter 1 of TS, Kindly refer to Corrigendum/Addendum, Item No 74. Kindly refer to corrigendum/addendum No 188 Bidders understanding is correct . Postion and location of camera shall be finalised during coverage drawing and design finalisation stage This is design and buld contract . Bidder has to quote the quantity as per his degin & estimation. inimum BOQ defined in price schedule, Kindly refer to Corrigendum/Addendum, Item No 31
422	8.4.2.2	Coverage of CCTV surveillance system for the stations, depot, OCC shall be developed by the N1TL01 Contractor and submitted to the employer for review.	We understand from the table that CCTV cameras are not required to cover Depot periphery. Kindly confirm.	CCTV covergae is required for depot permeter survilliance. provision of para deleted kindly refer to corrigendum/addendum Item No 189

PART A Pre Bid Minutes

		Provisional Bill of Quantity for CCTV Surveillance System Units to be provided at various locations is as under:-	As per clause 8.4.2.2 and Annexure-A station wise camera quantity is different. Please clarify. A table has been provided mentioning the number of cameras at various locations. There is another Table mentioned in Annexure A on Pg 397 where the Camera quantity are different .The Camera quantities in the BOQ are also different than the above. Which are the quantities to be considered ?.	(1) kindly refer to corrigendum/addendum Item No 189. (2) annexure A deleted , (3) Bidder shall quote no of camera complying the Specification & requiremet in Bid Document. Minimum BOQ defined in price schedule, Kindly refer to Corrigendum/Addendum, Item No 31
423	8.4.2.3	One CCTV control MMI shall be provided each for SCR, Security Booth(s), PSB, DCC / DSC, Traffic Controller, Chief Controller and for the OCC / BCC Security controller. Please refer to Appendix H MMI Provision schedule for the requirements of MMI	Need details over PSB locations for MMI positioning. PSB location in not available. Kindly provide	CCTV HMI at PSB is not required . Kindly refer to corrigendum/addendum No 190
		In addition, the security control room in OCC, a video wall of 5 x 2 x 70" i.e. 10 cubes of 70 inch size arranged in 2 rows and 5 columns shall be provided for monitoring images from stations, depot, RSSs etc. No video wall in BCC required.	No. of camera to be monitored on Video wall is not clear.	Supply of Video wall deleted from the scope. It is required to display up to 64 Camera's view in High Definition per Monitor of the Video Wall . Contractor is required to design suitable hardware/software for the same.
		In addition, the security control room in OCC, a video wall of 5 x 2 x 70" i.e. 10 cubes of 70 inch size arranged in 2 rows and 5 columns shall be provided for monitoring images from stations, depot, RSSs etc. No video wall in BCC required.	No of camera to be monitor in Video wall is not clear. Pl clarify	
			Please share the complete specifications for LVS & LVS Controller indicating few things as below: What light source to be use (Laser/LED).....Should be laser as also required in Nagpur S&T project. Please confirm.	
			How many inputs required in controller with their type. Please provide.	
			How many streaming inputs and at what resolution. Please provide. Please shared the complete specifications for LVS & LVS Controller indicating few things as below:	
424	8.4 . 2 . 5	The TV standard to be employed shall be ITU-T, PAL, 768 scan lines per frame, 30 frames per second with progressive scan.	"768 scan" lines are applicable to analog camera hence pl. remove this content	Bidders request accepted. Kindly refer to Corrigendum/Addendum , Item No 191
425	8.4.3.2	Monitoring of entraining and detraining of passengers and surveillance of train doors from the head end driving cab position at all stations of NMRCL shall be provided by the platform CCTV system.	-	Kindly refer to corrigendum/addendum No 192
426	8.4.3.3	The video signals of these CCTV cameras monitoring the platform and train shall be available to the following equipment simultaneously at all stations:	-	Kindly refer to corrigendum/addendum No 193
427	8.4.3.5	The stations / depot surveillance system shall have minimum 55 cameras at elevated stations of all types put together, 2 camers per parking and 28 cameras at depot.	-	Kindly refer to corrigendum/addendum No194
428	8.4.4.1	The Network Video Recording system shall provide Failover and Redundancy.	Mirror recording is already being proposed at adjacent station. Kindly explain the functionality of failover option required apart from mirror recording.	NITL01 shall be reponsible to design and implement NVR network in such a way that in case of failure of one station's NVR should not impact redundant NVR functionality which shall be installed at adjacent station.
429	8.4.4.3	The video recorder shall be capable of operation for 24 hours per day 365 days per year.	Kindly suggest the retention period the video shall be stored at different location (days, fps, resolution etc.)	Retention period will be 30 days
430	8.4.4.6	Video recording shall be temper proof so as even the administrator shall not be able to delete any video clip from any camera. Any attempt to delete or edit of video clips shall generate the alarm in the system which can be sent to the administrator.	We understand that the requirement to raise alarm if recording is tampered and deletion protection need to be managed with windows authentication. Pl. confirm. Kindly remove the sentence.	No change in TS clause Bidder request declined. Provision of tender clause will prevail.

PART A Pre Bid Minutes

431	8.4.4.7	NITL01 Contractor to note that Part 1 – Bidding Procedure: Pricing Document gives the indicative minimum BOQ to be covered as part of the scope of work and any other item or enhancement of the listed items required to complete the NITL01 Contractor shall also be provided as part of this fixed lump sum contract. Additionally NITL01 Contractor to please also note that all responsibilities and costs for materials, services, interface with all other relevant contractors, etc in connection with integration of videos with the existing video wall shall be borne by NITL01 Contractor as part of this lump sum contract with no additional cost.	Please share the complete details for the existing Video Wall with which the additional responsibilities and costs for materials, services, interface with all other relevant contractors, etc in connection with integration of videos with shall be borne by NITL01 Contractor as part of this lump sum contract with no additional cost.	This shall be part of interface . Bidder to make provisions accordingly . Provision of video wall is in the scope of NS01 Contractor
432	8.4.5.1	All alarm status of the CCTV system equipment including CCTV cameras, video recorders, Layer-2 Switches etc as necessary and approved by the Employer's representative shall be monitored by CCTV Management System/Network Management System in the CER at the OCC/BCC and shall automatically generate an audio/visual alarm on the CCTV Management System on occurrence of an alarm.	Layer 2 switches cannot be monitored via CCTV NMS. We propose to monitor the alarms via GE NMS. Please confirm.	clause modified, kindly refer to corrigendum/addendum No 195
			Integration of CCTV Cameras, Video Recorders with NMS (Network Management System) is difficult to meet on Video Management Software. Such integrations require Incident Management System and which also help operator to handel the event / incident effectively. Incident management system specifications is missing in tender. Also integration with rolling stocks cameras i.e monitoring on board cameras inside train is not mentioned in tender.	Provision of incident management system included in scope
			VMS is not specifically meant for network monitoring tools. All the said specification required incident management system, which is not part of this RFP.. Request to kindly incorporate the same	
433	8.5.1.6	The CCTV Central Management System in OCC / BCC shall be installed on servers within a cluster of 2 servers or more. In case a server in the cluster fails, another server in the cluster shall automatically take over the failed server's job running the management system. or Bidder may propose Virtualized solution by having all services applications, Database, Management servers including other system applications in Virtualized manner to optimize the solution hardware etc as per bidder design.In such case Subsystem/system redundant software shall be residing in separate server other than primary application server which should work in Hot standby mode.	Redundancy of Central management server in OCC /BCC is not clear.	clause modified, kindly refer to corrigendum/addendum item No 196
434	8.5.1.7	The Central System shall include the management of all devices, servers and users for centralized monitoring, reporting, and alarm management, software configuration uploads and downloads to client stations, firmware and software upgrades. These functionalities shall be implemented on two terminals in each OCC/BCC.	We understand that the mentioned functionalities shall be available in CCTV Surveillance Workstation/MMI for 2 operators in each OCC/BCC. Kindly confirm.	Clause is self explanatory
435	8.5.1.8	The CCTV system shall afford viewing simultaneously at the SCR, PSB, Police booths at the station. Depot Control Centre / Depot Security Control at the depot and from the OCC / BCC at full frame rate. The viewing shall be at 4CIF 25 fps. The normal full HD 25 fps shall determine the size of the storage device. The storage capacity shall be calculated keeping in view the spare capacity of 25% of the installed capacity. The primary recording shall be at the station TER and the recording shall also be mirrored at the adjoining station at the same frame rate and resolution. NITL01	Camera Recording resolution in not clear. Please clarify.	Camera recording resolution shall be at Full HD. kindly refer to corrigendum/addendum item No 197
436	8.5.1.9	While brands of the hardware have been specified, considering the requirement of availability, maintainability and MTBF, it is preferable that the brands out those specified may be chose by the bidder so as to justify the MTBF and availability of the entire system during the detained design from the published figures in the data sheets and later substantiate the same during the DLP period		Kindly refer to corrigendum/addendum No 198

PART A Pre Bid Minutes

437	8.5.2.1.4	Unless specified otherwise elsewhere in the TS, cameras, field switches, PF Monitors and other equipments meant for outdoor installation, shall be suitable to work from 0 degree to +50 degree C with RH up to 80% non condensing	-	Kindly refer to corrigendum/addendum No 199
438	8.5.2.1.6	new para added	-	Kindly refer to corrigendum/addendum No 200
439	8.5.2.1.7	new para added	-	Kindly refer to corrigendum/addendum No 201
440	8.5.2.3.1	Housing Arrangement shall be designed for both outdoor and indoor use and shall meet requirements for camera enclosures.	-	Kindly refer to corrigendum/addendum No 202
441	8.5.2.3.3	4. Aluminum housing & casing, neoprene gaskets, UV-resistant polymer end caps and all stainless steel hardware.	Kindly explain Stainless steel hardware. While, housing & casing is given in aluminium.	Bidder request declined. Provision of tender clause will prevail.
442	8.5.2.3.5	The camera shall work on 220 V AC voltage or 24 V AC or 12 V DC or 24 V DC, as required as per the design and implementation	Pl. allow for PoE also.	Bidders request accepted. Kindly refer to Corrigendum/Addendum, Item No 203
443	8.5.2.4.1	Mounts shall be suitable for indoor and outdoor mounting units designed for fixed cameras or camera housing installations. The mount shall be of the same make as housing	-	Kindly refer to corrigendum/addendum No 204
444	8.5.2.5 (c)	C. Sensitivity (@ F1.2, 30 IRE or better)	Most of the fixed camera comes with F1.4 aperture range with higher sensitivity. Proposed camera is having 0.01 lux color/0.001 lux BW @ F1.4 which gives clear and sharp picture in low light areas. C. Sensitivity (@ F1.4, 30 IRE or better)	Bidder request declined. Provision of tender clause will prevail.
445	8.5.2.5 (E)	Video resolution	-	Kindly refer to corrigendum/addendum No 205
446	8.5.2.5 (Y)	Makes for cameras .	We request you to please add "Axis" camera in the approve make list	Make of camera deleted from spec. Bidder shall propose the make complying the technical spec. Kindly refer to corrigendum/addendum No 206
447	8.5.2.6 (3)	Sensitivity (@ F1.2, 30 IRE or better)	Most of the fixed camera comes with F1.4 aperture range with higher sensitivity. Proposed camera is having 0.01 lux color/0.001 lux BW @ F1.4 which gives clear and sharp picture in low light areas. C. Sensitivity (@ F1.4, 30 IRE or better)	Bidder request declined. Provision of tender clause will prevail.
448	8.5.2.6 (5)	Video resolution	-	Kindly refer to corrigendum/addendum No 207
449	8.5.2.6 (8)	High Definition IP Fixed Dome Camera (Day / Night) Enclosure IP66, NEMA-4 or better	IP66 and NEMA4 are same however few OEM complies with NEMA4 and few others comply with IP66, pl. modify to IP66/ NEMA4	Bidders request accepted. Kindly refer to Corrigendum/Addendum, Item No 208
450	8.5.2.6 (9)	802.3af compliant and 12V DC / 24 V AC dual power options	Project is combination of Fixed, PTZ & Panoramic cameras. All these cameras has diff POE power requirement whereas customer has given general specs of 15.4 watt per port. PTZ cameras requires higher POE power so is it possible to get this POE power required for industrial grade switch to be changed from 802.3af to 802.3at	Bidder request declined. Provision of tender clause will prevail. Industrial grade switch deleted from scope.
451	8.5.2.6 (26)	Makes for cameras	-	Kindly refer to corrigendum/addendum No 209
452	8.5.2.7 (C)	Sensitivity (@ F1.2, 30 IRE or better)	Most of the PTZ camera comes with F1.6 aperture range with higher sensitivity. Proposed camera is having 0.15 lux color/0.01 lux BW @ F1.4 which gives clear and sharp picture in low light areas C. Sensitivity (@ F1.6, 30 IRE or better)	Bidder request declined. Provision of tender clause will prevail.
453	8.5.2.7 (E)	Video resolution	-	Kindly refer to corrigendum/addendum No 210
454	8.5.2.7 (FF)	Make subject to meeting the above specs	-	Kindly refer to corrigendum/addendum No 211
455	8.5.2.7 (V)	Sector Blanking : Camera 360 degree pan rotation to be divided in 8 sectors and any sector should be blanked as required by the operator	Feature is vendor specific, functional requirement can be met with privacy masking zones. Proposed camera support up to 4 privacy masking areas for object blanking .	Bidder request declined. Provision of tender clause will prevail.
456	8.5.2.8 (2)	Total Sensor Pixels: 5 MP	Total Sensor Pixels: 3 MP	Bidder request declined. Provision of tender clause will prevail.
457	8.5.2.8 (3)	Sensitivity Color Mode : 0.36 lux Night Mode (Black & White): 0.12 lux	Sensitivity Color Mode : 0.5 lux Night Mode (Black & White): 0.1 lux	
458	8.5.2.8 (5)	Video resolution for 360 Deg. : 5 MP	Video resolution for 360 Deg. : 3 MP	
459	8.5.2.8 (6)	Video resolution for 180 Deg. : 5 MP	Video resolution for 360 Deg. : 3 MP	
460	8.5.2.8 (9)	Supported Protocols : 802.1x, iSCSI,SOAP, Dropbox,CHAP,LLDP	Supported Protocols : IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP/RTCP, IGMP V2/V3, ICMP, RTSP,FTP, Telnet, ARP, DHCP, NTP (SNTP),SNMP (V1, MIB-II), DNS, DDNS , SMTP UPnP (SSDP),DiffServ (QoS) etc.	
461	8.5.2.8 (18)	Operating Temperature: -20°C to + 50°C	Operating Temperature: -10°C to + 50°C	
462	8.5.2.8(23)	Makes for cameras	-	Kindly refer to corrigendum/addendum No 212
463	8.5.2.8	360 Degree Panoramic View Camera	Please advice where these cameras will be installed in station/OCC/Depot.	These will be provided at station/OCC/Depot
464	8.5.2.9	Field Switches (industrial grade) shall be provided at Platforms, Concourses and in Depot areas, where air- conditioning environment is not available. Ethernet output from the IP cameras (Fixed and PTZ) shall be directly connected to the field switch	Please clarify over the specification of Optical fibre cable required for uplinks. Kindly Give the Specifications for Layer 2 switches so that there is no ambiguity	Kindly refer to Annexure D of Chapter 12 part 2 Provision of switch shifted in scope of FOTS, Kindly refer to corrigendum/addendum No 213

PART A Pre Bid Minutes

		through data cable and suitable protection devices. The outputs of the field switch shall be connected to the two aggregate switches by using 2 x 1 Gigabit Fibre Uplinks through separate optical fibre cable to the redundant ports available in TER switches.	Considering the network and camera requirements at various locations, we would like to propose following suggestions: 1) Based on camera count at different locations 4/8/16 port switch can be utilised for an optimised solution. 2) Also, Gigabit (10/100/1000 Base-T) ports is having lower latency in comparison to 10/100 Base-T ports. Considering that these switches will be used for CCTV low latency application, we would highly recommend, to consider switch with flexibility of 4/8/16 x10/100/1000 Base-T ports and 2 1G Fibre uplink ports.	Minimum configuration of switch specified in FOTS & BOQ,
			Considering that PTZ cameras can be powered with PoE+ 30W of PoE power in line with IEEE 802.3at open standard. So would request you to consider switch with all ports simultaneously capable to feed PoE+ power to end devices.	Scope of switch shifted to FOTS, bidder may propose POE+power as per his design. Kindly refer to corrigendum/addendum No 213
465	8.5.2.10	Video wall shall be supplied and installed at OCC security control room by NIS01 Contractor	Please clarify over the specifications of Video wall. Please share the complete specifications for LVS & LVS Controller indicating few things as below: What light source to be used (Laser/LED).....Should be laser as also required in Nagpur S&T project. How many inputs required in controller with their type.Please provide.	Video wall is in the scope of NS01 Contractor, details is part of Interface.
466	8.5.2.11 (5)	Digital CCTV Keyboard	Request to change -Joystick (keyboard) should support RS 232/ RS 485 or Ethernet or USB port Reason -(RS232 and RS485 are the major interfaces used for connectivity and PTZ handling. RJ 11 do not have any major use for PTZ handling or monitoring. Need to specify the use for customization)	Bidders request accepted. Kindly refer to Corrigendum/Addendum, Item No 214
467	8.5.2.12 (1)	Processors	-	Kindly refer to corrigendum/addendum No 215
468	8.5.2.12 (7)	Hard Drives	-	Kindly refer to corrigendum/addendum No 216
469	8.5.2.14.1(1)	Intel Xeon processor E5 - 2640 2.2 GHz or better 15MB L3 cache, Hyper-Threading Technology with 7.2 GT/s QPI Speed and scalable upto 2 Processors, configured with Redundant Power Supplies"	-	Kindly refer to corrigendum/addendum No 217
470	8.5.2.14.1(3)	32GB DDR 3 Registered Low Voltage DIMMS, 1333 MHz or better scalable to 128 GB of memory	-	Kindly refer to corrigendum/addendum No 218
471	8.5.2.14.1(4)	Minimum 2 x 300 GB SAS 15 KRPM or Better in RAID1	-	Kindly refer to corrigendum/addendum No 219
472	8.5.2.14.1(13)	new clause added	-	Kindly refer to corrigendum/addendum No 220
473	8.5.2.16	The Infra Red (IR) illuminator (inbuilt in camera or external) shall provide high quality 850 nm or better IR illumination. The IR function can be controlled via the video output of the camera	Since IR illuminator and camera are two different hardware and IR illuminators have inbuilt light sensor which help LED to on/off on lux level hence pl. remove this line.	No change required, both the options given
474	8.5.2.17.2	Intelligent Video Analytics shall be implemented on the proposed cameras.	Please specify the requirement feature of Video Analytics. Video Analytics redundancy same as Video Management System is not mentioned in tender.Please clarify whether video analytics features should also meet redundancy as mentioned for VMS. Also whether video analytics features(License) is bound to the MAC address of the device. Analytics software shall detect crowd and raise alarm. Pls confirm, if this fulfills the requirement. Else, pls explain the requirement in detail.	Kindly refer to corrigendum/addendum item No 221 This Rule counts the number of people within a pre-described area based on parameters. With this rule, system shall be capable to let operator know about number of persons in a particular area (Area defined under the rule). This rule shall be configurable to let operator know in case number of persons exceed threshold (pre defined number of persons allowed) quantity for the area.
		counter flow detection overcrowding detection (VA)		In case person starts moving opposite direction to the desired. For example: a person tries to enter paid area through exit gates or vice versa

PART A Pre Bid Minutes

		Line Control (VA)	Kindly explain counterflow detection in detail	This Rule counts the number of people and provide alarm as per configuration for entering and exiting an area based on a single tripwire line drawn on the threshold between two areas. Alarms can be generated when any given number of people enter or exit the area within a set period of time. This shall enable system to generate alarm if some person moves across line , area mentioned in the VA Screen .e.g.. A person tries to cross yellow line while train is arriving or departing from the station.
475	8.5.2.17.6	C. Excessive Queuing (VA)	Please explain in details	Rule to trigger alarm in case of over crowd at the /entry/exit/access gates .E.g. monitoring metrics such as the length of customer wait times at registers or service counters,
476	8.5.2.17.7	Minimum of 16 cameras of each station, 4 cameras of depot, 16 cameras of OCC shall be provided with Video Analytic functions. Total number of camera Analytics for all 16 cameras of each station shall be 30, for depot it shall be 8 and for OCC, it shall be 32. The distribution of the total Analytics to the various cameras at the relevant locations shall be developed during detailed design.	As per first statement of this requirement we understand Video analytics licences required are following: Stations: 16 cameras (for each 37 stations) Depot: 4 Cameras OCC: 16 Cameras Kindly clarify.	Bidders understanding is correct, Kindly refer to corrigendum/addendum item No 222
477	8.5.2.18.3	Minimum recording shall be for 15 days.		Kindly refer to corrigendum/addendum No 223
478	8.5.2.18.4 (21)	export recordings (for example, for use as evidence) as still images (JPEG), in media player format (AVI), or native database formats.	Bidder assumes that Window Media Video is also accepted	Bidders understanding is correct
479	8.5.2.18.6 (2)	Default alarm state shall be available, which shall be new, in progress, on hold, and closed.	We understand that the alarm generation types requirement for CCTV system is high/urgent/low limit alarms. Also, alarms once acknowledged only shall be removed from alarm summary. Alarms should not be on hold considering severity of solution hence allow with above type of alarms.	Contractor may propose the solution during design stage
480	8.5.2.18.6 (L)	It shall be possible to enable a sound notification which shall alert operators of new alarms. It shall be possible to use a default sound file or a custom .wav file which can be uploaded to and tested in the management client. It shall be possible to remove the sound notification if it is no longer needed.	We understand that this is just an alarm management capability required in the CCTV Surveillance Software. Kindly confirm. In addition, we understand that the additional loudspeakers are not required for operator workstations for the above alarm notifications. Kindly confirm.	Additional loudspeaker not required, inbuilt speaker of workstation will be sufficient.
481	8.5.2.18.7	STANDALONE VIEWING CLIENT	We understand this standalone viewing client is media player application which will be used to play the exported videos from NVR. Kindly confirm.	Provision of clause are self explanatory
482	8.5.2.18.8	MOBILE VIEWING CLIENT (Atleast 20 licenses) It shall be possible to access and view cameras and views on a Smartphone or a tablet (a mobile device). Mobile Client should have live and Playback functionality.	Infrastructure to be provided by NMRCL to facilitate this feature. For mobile client, whether NMRCL need to have two way communication i.e does mobile app want video from field to send to control room.	No change in TS requirement, bidder to provide all the infrastructure It shall be one way communication as defined in TS clause
483	8.5.2.18.10	New Clause added		Kindly refer to corrigendum/addendum No 224
484	8.5.2.18.11	New Clause added		Kindly refer to corrigendum/addendum No 225
485	8.6.6	New Clause added		Kindly refer to corrigendum/addendum No 226
486	Annx A	Provisional Bill of Quantity for CCTV Surveillance System Units to be provided at various locations is as under:-		Kindly refer to corrigendum/addendum No 227
487	Annexure B	List of Interlocking station	There is no list mentioned in this Annexure. It shows Blank. Request elaboration of Interlocking station.	Interlocking station is not relevant. Kindly refer to corrigendum/addendum No74
488	Annexure C	List of Receiving Sub Stations	There is no list mentioned in this Annexure. It shows Blank.	
Part II Section VII-B, Works Requirements Technical Specifications (FOTS)				
489	9.1.1.1	For efficient metro railway management and operation, it is essential to have a well organized communication infrastructure covering strategic locations like OCC, stations, depots and any other NMRCL locations. It is equally essential to have highly reliable links between the strategic locations and moving trains or working staff along the railway track.	How many Sites are in total (OCC, BCC, stations etc) to be connected over FOTS .Please share the distance of locations in Meters. Please share the distance of locations in Meters. This clause is referring to "...any other NMRCL locations". Kindly advise it is referring to which other locations.	Details of location enclosed in chapter1, Section VIIB, Part 2, Kindly refer to Corrigendum/Addendum, Item No 74

PART A Pre Bid Minutes

490	9.1.1.4	The FOTS shall provide a common transmission backbone for all the Telecom Subsystems: Telephone Subsystem, Train Radio Subsystem, Public Address Subsystem, Closed Circuit Television Subsystem, Passenger Information Display Subsystem, Master Clock Subsystem, and Fault Reporting Subsystem, Access Control and Intrusion Detection Subsystem and Voice Recording Subsystem. The FOTS shall also provide Ethernet connectivity for the Office Automation and Information Technology (OA and IT).	We understand that Fault Reporting Subsystem is same as T-SCADA System as in Chapter 11 of the TS. Kindly confirm. We understand the fiber cores of the same FOTS cable can be used for the OA & IT System to create separate network. Please confirm. Please provide the indicative ethernet port requirement for OA & IT system at each designated location.	(1) Bidders understanding is correct, (2) Min qty for OA&IT is indicated in BOQ, kindly refer to corrigendum/addendum No 31
491	9.1.1.9	A Network Management System shall be provided at the OCC and BCC to monitor status of all the FOTS equipment and control the operation and maintenance process. It shall provide alarm surveillance, performance monitoring, configuration management, failure management as a minimum as per operational requirements. orBidder may propose Virtualized solution by having all services applications, Database, Management servers including other system applications in Virtualized manner to optimize the solution hardware etc as per bidder design. In such case Subsystem/system redundant software shall be residing in separate server other than primary application server which should work in Hot standby mode.	what will be Quantity for NMS Nodes . Total number of Active switching devices with 50% scalability.	(1)NMS shall be provided at OCC & BCC. (2) total number of active switching device shall be part of detail desgin. Kindly refer to corrigendum/addendum item No 228
492	9.1.1.14	The FOTS shall conform to the applicable ITU-T and IEEE standards and shall fulfill the EMC standards EN55022 class A and EN50082-1.	EN50082-1 -This standard applies to apparatus intended to be directly connected to a public low-voltage mains network or connected to a dedicated d.c. source which is intended to interface between the apparatus and the low-voltage public mains network. so it not applicable for LAN/WAN Switches please remove "EN50082-1" (This Standard is already suspended)	Bidders request accepted.Kindly refer to corrigendum/addendum item No 273
493	9.1.1.16	The FOTS shall provide transport for the OA/IT network but the OA/IT network shall be totally isolated from the FOTS services serving the rail subsystems.	We understand that logical isolation(VLAN) for OA/IT network to be provisioned on FOTS. Please confirm our understanding is correct.	Clause is self explanatory. However requirement of networking equipment is covered in the scope.
494	9.1.1.18	Separate transmission backbone and network should be used for Communication Based Train Control System (CBTC).	We understand that backbone fibre cable will be same for CBTC; FOTS will provide dark fibre as required for CBTC system. As per clause 2.1.7 (Page 275) of PART I – CBTC & SIGNALLING SYSTEM, “The outdoor single mode optical fibre cable shall have minimum fibre count of 48 fibres” whereas as per FOTS, fibre optic cable with 144 fibres is required. Please confirm the fiber count to be provided..	No fiber to be provided for CBTC. Kindly refer to corrigendum/addendum item No 230
495	9.1.2.1	Scope of Supply q) Internet connectivity and hardware firewalls to local service provider for internet service for OA/IT. The FOTS networks serving the rail subsystems shall not be connected to the internet.	We understand that provision of internal connection and related connection & liaisoning charges are not in NITL01 contractor scope of work. Secondly, as per 9.1.1.17 The FOTS networks serving the rail subsystems shall not be connected to the internet. It requested to limit the FOTS subsystem for OA/IT connectivity to the dark fibre only. Kindly confirm.	(1) Kindly refer to corrigendum/addendum item No 231 (2) OA&IT network is physcially isolated from FOTS & separate network
		The Scope of Supply shall include all FOTS Network Equipment, software and manuals for the following:	Please be specific on the selected rooms of OCC, depots, stations for OA/IT	This is part of detail desgin
			We understand that OA/IT is not in the scope of NITL01 contractor and will be covered under separate contract by NMRCL. Kindly confirm. We understand that we need to provide dark fibre and port only for OA/IT as per clause 9.1.3.1.4 Table 5.1 Sl. no. 9 in TER. We suggest that the LAN wiring between selected rooms of depots, stations and RSS areas and the local TER for OA/ IT should be in scope of OA/IT contractor.	LAN wiring & provision of switch for OA&IT is in the scope of the Contract.
			do we need to provide internet connectivity from ISP?? Where to provide and what is the bandwidth required??	Internet connectivity is not in the scope
496	9.1.3.1.4	Depending on the subsystems connection performances requested (bandwidth, level of service, type of data, network interface,) and on the different intrinsic solutions, the following FOTS solution is proposed:	-	Kindly refer to Corrigendum/Addendum , Item No 232

PART A Pre Bid Minutes

497	9.1.3.1.6	GE IP backbone rings, of 10 Gbps, shall be formed using multilayer ring structure in the network to support all Telecom Subsystems and non-telecom systems requiring transport.		Kindly refer to Corrigendum/Addendum , Item No 233
498	9.1.3.1.7	The design shall ensure that the high-bandwidth subsystems do not affect performance of the low-band width subsystems. If required, the Contractor can propose a separate network for the two networks i.e. High Bandwidth and Low Bandwidth. In event of the Contractor proposing a single back bone, it shall be his responsibility to ensure availability of performance parameters of all subsystems working on the single network, failing which the Contractor shall have to provide a separate network for Low bandwidth systems free of cost	Does this mean the contractor can provide single ring solutions for FOTS connectivity? Please clarify	Single ring solution is Not acceptable
499	9.1.3.4.4	The Contractor shall propose a fibre cable that supports the specific metro railway constraints, and shall determine the exact total number of fibres		Kindly refer to Corrigendum/Addendum , Item No 234
500	9.1.3.4.11	OF cables, which run in the exposed areas or where directly buried in ground shall be contained in protective conduits and shall be as approved by Employer.		Kindly refer to Corrigendum/Addendum , Item No 235
501	9.1.4	Giga Ethernet Backbone Network	What is power system requirement for IP network components like routers, switches, IPS/IDS, Firewalls etc. Is it – 48V DC or 220V AC? Please clarify.	NMRCL will provide 220 V AC UPS supply in UPS Room
502	9.1.4.1.5	The Access Switches proposed for various sub systems including outdoor / rugged Industrial Gigabit switches should support Ring resiliency based on Open standards and must ensure seamless interoperability with the FOTS WAN system to adopt a flexible Ring architecture between the Station level Distribution and various Access switches with in the station, Depots, OCC , BCC and other locations of NMRCL.	Need specification of Outdoor / rugged industrial Switches.	Industrial switch deleted, Kindly refer to Corrigendum/Addendum , Item No 236
503	9.1.4.1.8	The proposed Active – Active clustering technology at the Core , Distribution and Accesslayer switches must be supported over geographically diversified locations with an ability for seamless service fail over	More information / clarity on the requirement of Active-active clustering technology at Access layer is required	TS information is adequate.
504	9.1.3.2.2	The FOTS network shall be SDN ready and incorporate a central monitoring system to gather operational data for performance checking, historical trend analysis, and maintenance. This monitoring system shall provide facilities to handle filing, storage, display, and printing of historical records. A duplicate copy of all software shall be provided on suitable storage media for backup and further development purpose. Failure alarms shall be classified into user configurable major / minor alarms. All alarms and status changes shall be stored in local storage of network elements, stored in mass storage device at the main TER and output to the printer on demand. All alarms and status shall be stamped using the Clock System's time and date reference	Please specify the time duration for which the alarms need to be stored for future reference for clause 9.1.3.2.2, 9.1.3.2.4 and 9.1.12.5.	This is part of detail design
505	9.1.4.2.3	Ethernet Switches	In some places Industrial grade is mentioned for all switches. However, For Core and Distribution Industrial grade is not required as this will be placed on AC cooled Data Center or hub rooms. These switches would be placed in Hub rooms at stations which are indoor and away from Direct sunlight and heat and natural elements. Therefore Industrial grade is not required.	TS clause is self explanatory. Industrial grade switch are required only for outdoor application
506	9.1.4.2.3 (a)	a) This equipment shall provide interfaces to site LANs and other analogue and digital interfaces at sites.	As we are using ethernet switches for FOTS network which will provide Ethernet connectivity but it not possible for analog and digital interfaces, so please remove " other analogue and digital interfaces "	TS clause is correct & functionality needs to be provided
507	9.1.4.2.3 (c)	The switches in addition to normal GE / FE interfaces shall be modular & may support POE /POE+ for powering all the IEEE 802.3af capable device	Please share the details for PoE switches with Port numbers & Quantity	Industrial grade switches for outdoor location only

PART A Pre Bid Minutes

		support 10/100/1000 for powering all the IEEE standard capable devices	Is the requirement of POE/POE+ mandatory for all switches? If No, then please share the details for PoE switches with Port numbers & Quantity.	Details given in Minimum BOQ. Kindly refer to corrigendum/addendum item No 31
508	9.1.4.2.3 (d)	The switches to be deployed in the outdoor environment must be gigabit Industrial Grade switches with seamless capability to integrate the FOTS WAN backbone on open standards and the Centralized SDN provisioning controller of the Core OCC & BCC FOTS WAN	Please share the details for Industrial Grade switches with Port numbers & Quantity .	Details given in Minimum BOQ. Kindly refer to corrigendum/addendum item No 31
509	9.1.4.2.4 (a), (b)	Servers a) Dynamic Host Configuration Protocol (DHCP) and Domain Name Servers (DNS) shall manage the IP addressing and node naming throughout the Data Networks (including the LANs). b) DHCP and DNS servers shall be located in OCC/BCC	Since the FOTS system will not host any internet servers like Web server etc DNS server is not needed. Kindly clarify the purpose of these servers with in FOTS system. Kindly also clarify if we could use in built DHCP server feature with in the switching infrastructure if supported avoiding a need for additional server / OS etc which is an overkill infrastructure	DNS server required, no change in TS clause
510	9.1.4.2.5	A SDN ready Management workstation with GUI features shall be installed in OCC and BCC to provide the necessary control, supervision, maintenance, configuration and performance management. The design shall cater for standard NMS functions	What is meant by SDN ready Management workstation?	SDN is Software defined networking
511	9.1.4.2.6	Engineering Terminal a) A data port shall be provided for connection of a portable Engineering Computer Terminal in the TER at each station.	We understand that local portable Engineering Computer Terminal referred in this clause is same as laptop loaded with appropriate software. Kindly confirm.	Bidder understanding is correct
512	9.1.4.3.1 (c)	c) The equipment shall be rugged Commercial off the Shelf (COTS) for like metro, widely deployed across a wide range of metro networks.	As per Clause- 1.4.2.1 (ii) The WAN nodes shall be installed in TER." TER will be equipped with AC and not need for rugged equipment in TER. It is requested to amend the requirement stated as rugged equipment.	Bidder request declined. Provision of tender clause will prevail.
513	9.1.4.3.2 (d)	Network Synchronization d) The FOTS equipment shall support Ethernet synchronization preferably SyncE to IEEE 1588V2 standard/NTP. The synchronization shall have frequency as well as phase synchronization/NTP Server and Client functionality.	As per standard architecture, the Core switches should have capability to interface with mater clock source on SyncE/IEEE 1588v2 but switches at distribution & access layer will only support NTP server synchronization. Hence please categorize clock requirement on basis of core switch/distribution switch & access (LAN switches)	This is part of detail desgin
514	9.1.6.3.3	The availability of any circuit within FOTS shall be better than 99.999% assuming zero travel time.		Kindly refer to Corrigendum/Addendum , Item No 237
515	9.1.6.3.4	The Network Management System shall be considered unavailable if any functions provided by the Network Management System cannot be properly exercised. The availability of the Network Management System shall be better than 99.6% assuming zero travel time.	Kindly advise what is meant by "assuming zero travel time".	It is minnum acceptable travel time, kindly refer to corrigendum/addendum item No 238
516	9.1.7.3	The service life of the FOTS equipments except server/workstation shall not be less than 15 years. The service life of all types of cables shall not be less than 25 years. The service life of Server/Work Station shall not be less than 10 years	Standard Service life for LAN/WAN equipment is maximum 10 years, Hence,we kindly request you to modify the cluase as " service life of FOTS equipment shall be upto 10 years." Standard Service life for LAN/WAN equipment is maximum 10 years, please modify "service life of FOTS equipment shall be up to 10 years." None of OEM provides service life of LAN/WAN devices more than 10 years. Also the life of all the commonly used interconnecting cables such as UTP, Patch cord and Pig tails cannot be 25 years as they are consumables. Request to keep consumable cables out of this clause. Standard Service life for LAN/WAN equipment is maximum 10 years, please modify "service life of FOTS equipment shall be up to 10 years." None of OEM provide service life of LAN/WAN devices more than 10 years.	kindly refer to corrigendum/addendum item No 239
517	9.1.8.1	In the event of an optical fibre cable break, the optical transmitter laser output shall shut down to a safe level as defined by IEC-825, ITUT-G 958. The shutdown mechanism shall not be software dependent.	IEC -825 is considered as EN- 60825 with the same/Enhanced specifications please modify "IEC-825" to "IEC-825 or EN-60825". ITUT-G 958 is related to SDH, please remove "ITUT-G 958" from the specifications. ITUT-G 958 is related to SDH, please remove "ITUT-G 958"from the specifications.	Bidder request declined. Provision of tender clause will prevail. In the event of fiber break , optical transmitter laser output shall be shut down to a safe level .

PART A Pre Bid Minutes

518	9.1.8.2	The absolute group delay at the frequency of minimum group delay shall not exceed 600 micro seconds taking into account of the worst delay scenarios.	<p>" ITU-T Recommendation G.712" Standard is specific to PCM technology, please remove this Clause. This feature can be achieved by other standard for data network(LAN/WAN) system.</p> <p>" ITU-T Recommendation G.712"Standard is specific to PCM technology. This feature can be achieved by other standard for data network (LAN/WAN) system. Hence, we kindly request you to remove this clause.</p> <p>Group delay is a concept applicable in SDH based system. The equivalent of Group Delay in Active Ethernet FOTS system is Latency. Kindly consider to replace the word Group Delay with end to end latency in each FOTS ring</p>	kindly refer to corrigendum/addendum item No 240
519	9.1.8.3	As a minimum, FOTS equipment shall support following types of signal interfaces: (b) Any other interface type, necessary to support long distance communication between E&M System equipment provided by the Contractor.	We understand that interface with E&M will be GE whereas this clause mentions that any other interface type, necessary to support long distance communication between E&M System equipment provided by the Contractor. Kindly advice.	please refer Drawings , Channels to be provided in ASS room . In case of large distance Fiber & O/E Converter to be provided . This shall be defined in detailed design .
520	9.1.11.1	The FOTS Network Management system and the network elements shall provide operation, administration, maintenance & provisioning (OAM&P) functions in accordance with the Telecommunications Management Network (TMN) concept described inITU-T Recommendations M-3010.	<p>"ITU-T Recommendations M-3010 "is specific to SDH, Voice System and other Telecom systems. For Data Netwok(LAN/WAN) NMS will be specific to Data Network Systems only. Hence, please remove/modify" ITU-T Recommendations M-3010 "</p> <p>" ITU-T is specific to SDH, Voice System and other Telecom systems. For Data Netwok(LAN/WAN) NMS will be specific to Data Network Systems only, please remove/modify" ITU-T</p>	kindly refer to corrigendum/addendum item No 241
521	9.1.16.3 (iii)	(iii)details on the hardware modularity of each type of data and voice interfaceincluding the incremental number of interfaces that can be added to a partially equipped equipment shelf and limitations on the addition of the interfaces to the equipment already equipped with mixed types of interfaces shall be defined;	The Active DATA Devcies are purely ethernet based. Please remove voice interface point as it belong to Telephony system.	Bidder request declined. Provision of tender clause will prevail.
522	9.1.17.5	At least 30% spare traffic bandwidth and capacity between nodes shall be provided. Spare capacity shall be achieved by catering for additional cards and/or modules, associated software, licenses and wiring to enable the user use / configure the spare capacity. The Contractor shall provide at least 20% spare circuit/port capacity available at the time of system acceptance for future expansion of fibre network.	We understand from clause 9.1.17.5 that 30% spare traffic bandwidth capacity has to be provided between nodes and from clause 9.2.4.2 we understand that optical/Ethernet Port data rate capacity shall have 20% spare capacity. Please confirm.	Clause 9.1.17.5 is for bandwidth & 9.2.4.2 is for hardware capacity
523	9.1.20.10	In the case of stackable equipment a built-in stacking capability is required	<p>Please keep stacking as optional. Because some design doesn't required stacking. Although the switch can be stacking capable for furture use.</p> <p>We request that the built-in stacking capability may be kept as optional. This is because some design doesn't required stacking. However, the switch can be stacking capable for furture use.</p>	Bidder request declined. Provision of tender clause will prevail.
524	9.2.1	Redundant Layer-3 switches at each station, depot & OCC/BCC as per Drawing NS1/WAN (Annexure-A of this Chapter) shall be provided as a minimum as part of this Contract. However to meet the requirement of this Contract and Designated Project Contractors , additional equipments if required shall also be provided by NS01 Contractor within the currency of this contract. No additional Cost to meet with the requirement of other project contractors will be given.	Kindly provide the Annexure A Drawing. Also NS01 Needs to be updated as N1TL01	Bidders request accepted. Kindly refer to Corrigendum/Addendum , Item No 242
			NS1/WAN seems to be a typo error and the reference is unable to locate for drawing. Kindly clarify.	
		station/Depot switch requirements are 2 x 10G and 4 x 1G Fibre ports	we propose 4x10G or 4 x 1G Combo ports. E.g. out of 4 ports we can use either 10G or 1G in any combinations .This will be sufficient as compare and used port at other metro projects. Please validate	No change in TS specification.

PART A Pre Bid Minutes

525	9.2.1.1 (ii)	(ii) Gigabit Ethernet Module. (Shall be Combo [1000 Base TX and SFP])	<p>Combo Ports on core/chassis based switch is not a standard. And no Line-Card/Modules supports combo ports, separate Line Card for 1000Base Tx and SFP are already considered in BOQ/TS</p> <p>Combo Ports on core/chassis based switch is not a standard. And no Line-Card/Modules supports combo ports, separate Line Card for 1000Base Tx and SFP are already considered in BOQ/TS (Volume I - Appendix J).</p> <p>As per the tender requirement as mentioned above,this type of device need 8*1GE optical interface and 48*1GE electric interface .But in clause no.9.2.1.1(ii)it is mentioned GE module shall be combo module.Please clarify which type of interface is required.</p>	Bidder to supply combo module as per spec
526	9.2.1.1 (v)	v) Number of Slots - Minimum of 12	<p>As per usage in other working metros. Not more then 5 modules have been used. With future expansion 2 slots each core, which counts 7 slots and is enough. As user end ports are not recommended to put in Core switches. And for any fibre slot expansions 2 slots are enough to catter. with intial 5 slots we will have enough ports for uplink and future expansion as the architure is Ring Topology which consumes less uplink ports.As per expansion requirement 30% of empty slots will be available with in 7 slot chassis.</p> <p>As per clause, requires chassis with minimum of 12 slots, however the port requirement mentioned in section 9.2.1 page no 418 shows minimum requirement of only 68 ports which can be achieved by having 3-4 slots with spare ports. Kindly suggest the requirement for 12 slot chassis.</p> <p>As per the current port requirement in bid, 3-4 service slot will suffice the requirement. Hence it is requested that instead of total 12 slots customer can ask for 30% free slots for future expansion. Please confirm whether our understanding is correct or not.</p>	Bidder request declined. Provision of tender clause will prevail.
527	9.2.1.6 (v)	Security Features (v) Session control	In the section security feature for Core Switch, there is sub section (v) Session control, Kindly elaborate what is expected from this feature?	Network seession of any VLAN can be defined & configured
528	9.2.1.6 (vi)	Security Features (vi) Centralized policy enforcement through a Secure Policy Manager	The Core switch can deploy policy from CLI interfaces. Policy manager is more meaningful for firewall/Instruction Detection System (IDS). Request to review.	Bidder request declined. Provision of tender clause will prevail.
529	9.2.2.1 (ii)	ii) Dedicated stacking Ports supporting 40 Gbps.	The infrastructure will be in ring topology with option of dual ring. This could be done without stacking as the FOTS will be passing through each Destribution switches.recommend to keep stacking as optional to consider multiple topology to have best solutions at place.	Stacking modalities and ring topology to be finalised during the design stage .
530	9.2.5.3	The FOTS shall interface with the subsystems as specified in PS to provide sufficient voice and data communications circuits or bandwidth for the subsystems at all sites.	As we are using ethernet switches for FOTS network which will provide Ethernet connectivity but it not possible for voice communication, so please remove " voice communication "	No change in TS specification
531	9.2.6.4	All equipment shall be modularly expandable to the following capacity without the need to replace the installed hardware and software of the system as a minimum: (a) An expansion in capacity of 30% by addition of cards and/or modules (b) An expansion in capacity of 30% by addition of equipment racks or cabinets	These two conditions (a) and (b), bidder needs to satisfy both of them or either of them? Because they are two different ways in terms of expansion.	Bidder need to satisfy both
532	9.3	new clause added		Kindly refer to Corrigendum/Addendum, Item No 243
PART II,		Section VII-B,Works Requirements Technical Specifications (ACIDS)		
533	10.1.1.6	10.1 ACCESS CONTROL AND INTRUSION DETECTION SYSTEM Vehicular and pedestrian barrier - Each depot entry's & exits shall be provided with vehicular and pedestrian barriers (as required). Size, number of barrier / specification shall be decided at the time of detail design;	pls. share details and drawings of entry & exit points, if not please indicate maxi No. of Doors at each location.	(1)Please refer minimum BOQ corrigendum/addendum item No 31 and (2) Part II, Section VII C for drawings.corrigendum/addendum item No-51

PART A Pre Bid Minutes

534	10.1.2.1	The ACS system shall use contact-less smart card with ID as the access media for smart card reader. The ACS smart card will be integrated with the AFC system to enable employees use the Metro as well as access their work areas. The Metro employees and sub Contractors shall be the target users.	Need details of AFC system. Technology of cards and Operating frequency Need details of AFC system. Technology of cards and Operating frequency. Kindly provide the same.	Smart card reader to comply with IS 14443 & IS 15693 standards as per TS requirement . Kindly refer TS Clause 10.1.6.5.5.
535	10.1.2.1(b)	Where doors are controlled by a smart card reader, an additional override key switch shall be provided as an alternative means of access.	-	Kindly refer to Corrigendum/Addendum, Item No 244
536	10.1.2.4	It shall be able to display all of the operational status and send the alarm signals to the ACS Local server. It shall also be able to detect sensor failure and the damage of connection wire.	We understand this is access controller, pl. clarify if different as it not mentioned in RFP BOQ	Bidder understanding is correct
537	10.1.2.5 (a)	a) The key switches shall be installed at the walls outside the stations and buildings close to the entry/exit accesses. They shall be able to start/stop the "ALERT" state and trigger alarm signals when they are destroyed.	Please let us know the qty and location where to be installed. These items qty are not appearing in RFP BOQ, pl. clarify do we need to consider?	Scope & location clearly defined in TS. Ref drawings of station enclosed in part IV. Please refer minimum BOQ corrigendum/addendum item No 31
538	10.1.3.2 (i)	Local ACS servers (Quantity of to be quantified during detail design)	What is the purpose of local ACS servers. As all devices are connected to central DB in central server, local stations can just have client. Pls Specify requirement of Local ACS Server, PLs share Drawings for Quantification Since all access controllers are IP based and can manage all the functionalities in standalone mode if communication between OCC central server and station is down. We recommend to consider only one server at central location for better management and cost effective solution. Maintenance cost will also reduce in many folds. OCC server's HMI clients can be provided at station level for local operation. Pl. allow. What is the purpose of local ACS servers. As all devices are connected to central DB in central server, local stations can just have client.	Local ACS server deleted from scope, Kindly refer to corrigendum/addendum item No 245.
539	10.1.3.2 (iii)	Sensor controllers /modules & software	Hope this is Access controllers & software. Please clarify	Bidders understanding is correct
540	10.1.3.2 (iv) (v)	iv. Override key-switch to access equipment rooms v. Special motion detectors	Please confirm No of locations	Ref drawings of station enclosed in part II, Section VII C. Please refer minimum BOQ corrigendum/addendum item No 31
541	10.1.3.2 vii	All power supply equipment required for ACS system	-	Kindly refer to Corrigendum/Addendum, Item No 246
542	10.1.3.2 xiii	add new clause	-	Kindly refer to Corrigendum/Addendum, Item No 247
543	10.1.4.6	Integrated with the CCTV HMI	Integration details and make, model of CCTV system are required.	Spec of CCTV & integration requirement are already specified in the Technical Specificatio & This is the responsibility of Contractor to design the system and submit for approval .
544	10.1.4.6 f	new clause added	-	Kindly refer to Corrigendum/Addendum, Item No 248
545	10.1.4.6 g	new clause added	-	Kindly refer to Corrigendum/Addendum, Item No 249
546	10.1.4.11	The employee master data base of NMRCL shall be synchronised on line with the ACIDS system data base for authentication.	Need details of NMRCL DB. What is the DB that is being used, how NMRCL DB will provide input to ACIDS DB. Kindly clarify	Kindly refer to corrigendum/addendum item No250
547	10.1.4.13	In addition to Access Control System there shall be a provision of attendance system using bio-metric (thumb or facia) access point reader at station, depot, OCC and RSS. Num ber of reader and specification shall be decided at the time of detail design. There should be provision for the generation and integration of attendance report to HR Systems through the network.	Please share the details of Location for Bometric readers 1. Which HR system will be used by NMRCL (master database)? 5. Integration purpose with HR system? We understand that HR system required to provide employees attendance data/report. Pl. confirm. 2. How NMRCL would provide data of Cardholders – during first time system start up using HR from SAP module or CSV? 3. How NMRCL would provide delta changes during site operations? 4. How many cardholders qty?	(1) This is part of detailed desgin. (2) Please refer tentative BOQ corrigendum/addendum item No 31 These details shall be part of Detailed design and Interface to be performed by N1TL01 .

PART A Pre Bid Minutes

548	10.1.5.2	a) A local access control server shall be installed in the TER within the depot, and each station.	Since all access controllers are IP based and can manage all the functionalities in standalone mode if communication between OCC central server and station is down. We recommend to consider only one server at central location for better management and cost effective solution. Maintenance cost will also reduce in many folds. OCC server's HMI clients can be provided at station level for local operation. Pl. allow.	Local access server deleted. Kindly refer to corrigendum/addendum item No 251
		In event of failure of the Central server or its connectivity the local server shall continue to provide all functionalities for the ACIDS	There is no requirement of local server as Access Controller can work in standalone mode. Kindly suggest if this will be fine.	
549	10.1.5.3	a) Support standalone operation while communication failure with central server		Bidder suggestion query not available.
			Pl. refer our request in 10.1.5.2 and hence OCC central server's HMI client at station will work only in case of connectivity is up with OCC. However all access controllers will remain operational without degradation. Pl. allow and confirm	Local server deleted from scope, however HMI is required. Contractor may propose Integrated HMI .
		a) Support standalone operation while communication failure with central server b) A stand-alone Work Station (in the depot and OCC only) to facilitate issue of new access control cards/modify and cancel access entitlements, etc.	Controller will have Data and storage capacity for events and will continue to work offline Stations can have web-client and it requires server to be online. As there will be redundancy at server and network level, can local server be eliminated? Pl confirm.	Local server deleted from scope, however HMI is required. Contractor may propose Integrated HMI .
550	10.1.5.4	Access Point Controllers	Here You have asked very general specifications for access point controllers. You are requested to incorporate following points as per global security standards- 1. Access controller should be UL (UL294B, UL1076, ULC-5319) certified, EN,FCC,CE. 2. Access controller operating Temperature to be 0 to 70*C for non air conditioning working & in harsh environment in case of fire etc. 3. Access controller should have 8 inputs & 8 outputs fully programmable for taking care of intrusion & alarm point near the access door. 4. In case main access controller fails then sub access controller should work in standalone mode. 5. Redundant communication port for more reliability dual IP on board. 6. Access point Controller should be POE & POE+ enabled capable of battery charging, powering up readers etc. The POE in controllers should be UL certified as power is very important factor & local POE arrangement are not reliable.	Bidder request declined. Provision of tender clause will prevail.
			it should have native IP communication not converter based	
551	10.1.5.4.2 (a)	a) Operate in conjunction with the local access control server	Since all access controllers are IP based and can manage all the functionalities in standalone mode if communication between OCC central server and station is down. We recommend to consider only one server at central location for better management and cost effective solution. Maintenance cost will also reduce in many folds. OCC server's HMI clients can be provided at station level for local operation. Pl. allow.	Kindly refer to corrigendum/addendum item No 252
552	10.1.5.4.2 (d)	Work in conjunction with a card reader which shall operate with Contact-less proximity detector type of cards (shall be carried by authorized staff) to gain access as authorized, to access control locations.		Kindly refer to Corrigendum/Addendum, Item No 253
553	10.1.6.1 (b)	b) The type of lock mechanism will depend upon the type of access point and shall be finalized during the Detailed Design phase.	Please share details of all type of doors and locations	To be decided during detail design. This shall be responsibility of NITL01 to coordinate with Station Civil contractor for make & type of Doors.
			Do you want all smart card readers as vandal proof pls clarify? Access control Readers should be compatible to AFC token Access control Employee badge should be compatible to AFC	

PART A Pre Bid Minutes

554	10.1.6.1.2	Electrical Locks	You are asking for fail safe & fail secure lock. EM Lock cannot work on both modes pls clarify if latch lock required. You are requested to incorporate UL certification for lock to ensure the best quality. Lock Power should be IBP controlled.	TS clause is self explanatory.
555	10.1.6.2	Access Point Sensors	You are asking for IP based access point sensor. Now a day's access point sensor comes as a part of lock & input goes to access controller directly. Therefore separate access point sensor may not be required.	Bidder request declined. Provision of tender clause will prevail.
556	10.1.6.2 (a), (b)	a) Each access point shall be fitted with a sensor, linked to the access point controller, to monitor whether the access point is open or closed. b) The access point sensors shall have IP interface.	Since Access point sensors are readers and to be connected to controller over wiegend interface, IP interface is not required. Pl. remove for cost effective solution. IP interface can be provided for biometer readers where enrolment is needed for fingers. Pl. confirm	Bidder request declined. Provision of tender clause will prevail.
557	10.1.6.5	Proximity identification Cards	You are requested to incorporate NXP certifications for the best of quality smart card.	Bidder request declined. Provision of tender clause will prevail.
558	10.1.6.5.5	Consideration shall be given as to the distances over which a proximity ID require to operate to cover pedestrian access at gates, vehicular access at barriers and door access, such as based on ISO 14443 for communications at distances up to 10 cm or ISO 15693 for distances up to 50 cm.	It should be Compatible with metro travel Readers. As AFC compatible cards to be considered, it depends on the AFC contractor regarding read range distance for cards.	Bidder request declined. Provision of tender clause will prevail. This shall be part of NITL01 Interface with AFC to ascertain Cards as per provided standards .
559	10.1.6.6 (a), (b)	a) In station areas to prevent public access to Back of House & Track areas. b) Around the vehicular and pedestrian entry & exits at depot	Pl. clarify how which all parameters to be considered for intrusion? Ambiguity with clause 10.1.9.7	Clause is self explanatory. Modification will be issued for clause 10.1.9.7, kindly refer to corrigendum/addendum item No 254
560	10.1.6.6 (d)	Details of sites /location to be provided with IDS facility shall be finalized during detailed design stage.	Pl. provide details of locations for cost estimation	Scope & location clearly defined in TS. Ref drawings of station enclosed in part II Section VII C. Please refer minimum BOQ corrigendum/addendum item No 31
561	10.1.6.6 (e)	The detection techniques / modalities shall include one or more of the following, all of which shall operate in conjunction with each other and the CCTV System, to continuously track intrusions within and across zones and all areas within the confines of the site	Please share location details details	
562	10.1.6.6 (f)	The Contractor shall propose, for each location, the most effective and technically feasible and cost effective detection facility which is cost effective.	Please share location details details	
563	10.1.8	Power Supply System	Power to access control & intrusion systems in metro scenario. Linear power supply to be used with inbuilt battery charger to take care of fallback mode.	Bidder request declined. Provision of tender clause will prevail.
564	10.1.8 (d)	Provision of suitable earthing, earth leakage detection and alarms shall be made individually at each location (station/depot/OCC, etc.)	We understand that earthing pits will be provided by other vendor per location and telecom bidder to tap earth cables within TER room, pl. confirm	Bidder understanding is correct
565	10.1.9.7	The Access Control & Intrusion Detection System equipment shall be installed at the site locations stated below: Receiving Sub-stations - Intrusion Detection - around building entrance	As per this requirement, It seems intrusion detection only needed at RSS and OCC and not at stations, pl. confirm	Kindly refer to corrigendum/addendum item No254
566	10.1.10.1 (a)	All Access Control sites shall be connected / networked via FOTS system. The mode of networking i.e. either through Fibre or IP interface shall be decided during detailed design stage. The data base shall be centralized at the OCC and DCC containing the data of all the personnel authorized and issued with access control cards through OCC or DCC system. Station servers shall be able to access any data pertaining to their area from the central data base. The relevant data shall reside in the station server as a front end for quick processing of access control, but all changes pertaining to an area shall be synchronized from the central data base so that only incremental change data is sent over the network from central server to local servers.	Pl. refer our request in 10.1.5.2 and hence OCC central server's HMI client at station will work only in case of connectivity is up with OCC. However all access controllers will remain operational without degradation. Pl. allow and confirm	Kindly refer to corrigendum/addendum item No 255

PART A Pre Bid Minutes

567	10.1.10.1 (c)	c) The Access ' Access control system database shall be capable of managing details of a minimum of 20,000 personnel, retaining a historical log of access control users and deletion of user details, after a pre-set period or as selected by the operator, whose access privileges have expired.	Access control system database minimum to be 50000 & logs of all alarms & events to be minimum 1lakh to work in offline mode.	Bidder request declined. Provision of tender clause will prevail.
568	10.1.10.2 (a)	Automatic self-test facility, automatic detection and automatic configuration	a. Where controller should be automatically detected. b. Configuration depends on various access parameters like reader port, IP Address, Input and output ports configured. Automatic configuration without configuring parameters is not possible	TS requirement is self explanatory.
569	10.1.10.3 (a)	An assessment shall be undertaken during the Detailed Design phase to determine the category of risk level to be applied, in accordance with EN 50131. Initially, the risk level shall be assumed to be high-risk which is classified as Grade 3.	we assume risk assement is done by independent third party and it is not in scope of Telecom Tender.	this shall be responsibility of the Contractor
570	10.1.10.3 (j)	On initiation of an alarm automatically (PoP up on CCTV HMI) , CCTV cameras within the affected zone shall employ automatic positioning and operator shall continuously adjust pan, tilt and zoom to keep the intrusion within the cameras field of view.	This is functionality of CCTV system	This shall be part of Access Control and CCTV Interface .
571	10.1.10.4 (c)	Management of cardholder functions(only for the stand-alone Work Station at the OCC and the Depot):	Workstation should be in the ACIDS network for changes to be transferred to Database and in the controller	Kindly refer to corrigendum/addendum item No 256
572	10.1.11.1.1	Security and Encryption	You are requested to incorporate 256 bit encryption for data security.	No change in TS clause
573	10.1.11.1.1 (a)	The system shall be immune to be hacked and shall provide end to end security and authentication of data.	Internet connectivity is not part of solution offering hence hacking point is not valid. Moreove Telecom package scope of work does not cover Firewall & Network Security sytems	It means all database shall be incrypted& to work in close environment
574	Annex A	Provisional BOQ	-	Kindly refer to Corrigendum/Addendum, Item No 257
PART II,		Section VII-B,Works Requirements Technical Specifications (TSCADA)		
575	1.2.8	...The control function shall only be actuated when the OCC & BCC has failed, shut down or during testing of OCC & BCC function...	Control functions required under T-SCADA are not clear. Please clarify.	Bidder to design and provide technical proposal and function & technical requirement described in the TS .
576	4.3.3.4	The availability figures for other T-SCADA subsystems viz. Software Development, Historical Record searching and Training Simulator shall be 99.7%.	Training Simulator functions are not clear. Please clarify.	Training simulator to be provided for class room training . Simulator is sufficient to simulate all real time functionality , interface and configuration of the proposed system .
577	4.5.1	The T-SCADA is classified as a safety related system and a minimum of CENELEC standards EN50128 software integrity level 2 shall apply.	T-SCADA is not involved in safety related functions, and hence SIL2 is not applicable. The same may be removed.	Bidder to design and provide technical proposal and function & technical requirement described in the TS .
578	2.15.3	MTTR, the contractor shall ensure that the availability parameters are met. TBCF of CTFRS server shall be better than 50,000 Hrs.	Pl. clarify meaning of TBCF?	It is MTBCF (Mean time between criticle failure
579	Chapter 11			There is numbering mismatch, chapter 11 replaced with modified chapter. Kindly refer to Corrigendum/Addendum, Item No 258
PART II,		Section VII-B,Works Requirements Technical Specifications (Chapter 12 Appendices)		
580	2.1.3.	The Automatic Train Control (ATC) System shall be supplied by the N1TL01 Contractor, who shall be required to liase closely with the Rolling Stock Contractor, in regard to the installation, testing and commissioning of the Signalling and Train Control Equipment.	Bidder assume ATC is not in scope of N1TL01 Contractor, seems Typo erro, please modify	Bidder understanding is correct .
Appendix				
581	A1	N1TL01/ ROLLING STOCK INTERFACES	Please ammend the Appendix-A1 with Telecom Contractor's and Rolling Stock Contractor's scope only as requirements mentioned in this section are related to other System Contractor's Works Scope .	Chapter 12 modified, Kindly refer to Corrigendum/Addendum, Item No 259

PART A Pre Bid Minutes

582	A2 (3)	2) Design, Supply and Installation of Base Frame, False Floor & under False Floor Cable Trays with required risers for wall mounted units in TER of Stations/Depot and under false floor cable trays in SCR. List of Stations (The scope of NITL01 Contractor) is given in Appendix C of this TS. 1. Layout of rooms at the station – Telecommunication Equipment Room (TER), UPS, and Station control rooms (SCR). 2. Track side equipment & Cabling infrastructure for Telecommunication System 4.Station Control Room	With reference to Appendix-A2 item no. 1/2/3 , we understand that Cable trays has to be provided in Telecom Equipment Room only . Pleasw confirm	MEP Contractor Shall provide Cable ducts/Hangers / cable trays up to the rooms. Whereas all secondary containment & cable tray are in scope of NITL01 contractor. Kindly refer to Corrigendum/Addendum 3, Item No. 259 NITL01 shall interface with MEP for Primary Cable containment .
583	A5 (3) (5)	Telephone connections to the corridor internal telecom network: Provide a telephone at -Each ASS Room -RSS Control Rooms -OCC inside at Nagpur Metro -OHE depot inside main depot at Nagpur Metro - Phone at Both Grid substation of electricity Board through leased line(leased line will be paid by NMRCL but arranged by Telecom Contractor) Phone at Both Grid substation of electricity Board through leased line(leased line will be paid by NMRCL but arranged by Telecom Contractor)	do we need to provide one telephone PSTN connection at each ASS, RSS, OCC, OHE and at both grid substation? what does this mean?? How do we provide telepone through lease line?? What is the scope of telecom contractor here?? Hope telecom contractor does not have to include the quote for the same in the proposal. Pls confirm and provide clarifications	Chapter 12 modified, Kindly refer to Corrigendum/Addendum , Item No 259
584	C	List of stations	For precise /accurate coverage of CCTV and TETRA prediction for outdoor and in-station coverage, please provide exact station GPS coordinates and layouts of Stations/OCC/Depot.	Kindly refer to corrigendum/addendum item No 74, typial drawings are enclosed in Part II Section VIIC .
585	D 1.2.1.5	The contractor shall comply in general with the pertinent requirements of NFPA 130 (Fixed Guide way Transit system 2007edition issued by the US National Fire Protection Association).	Do we need to get NFPA or releated certificate?Please confirm.	Bidder to submit compliance statement and credential .
586	D 2.2	between 1285 to 1330nm <0.25dB/Km(cabledfibre)	Generally, is 1285 to 1330nm ≤0.40dB/km ; 1525 to 1575nm ≤0.25dB/km please clarify.	Bidder request declined. Provision of tender clause will prevail.
587	D 2.3.3	Armour for the cable shall consist of single layer of galvanized steel tape corrugated, then it is said The thickness of stainless steel tape to alloy AISI 304 or 305.	it is inconformity. we suggest material of armour is chromed steel tape.	Bidder request declined. Provision of tender clause will prevail.
588	E SN 4	OFC 144/(72+72) Fibre armoured cable for elevated / at grade sections as per RDSO or TEC Specification (km)	Is "OFC 144 / (72 + 72) Fibre" mean one kind of fiber core, G652D type?	TS spec are seld explanatory. Kindly refer to Corrigendum/Addendum , Item No259
589	H	M M I Provision Schedule	MMI Provision for OCC and BCC is not clear. PI clarify	Kindly refer to Corrigendum/Addendum , Item No 259
590	H	Location Control Centre	We understand that Control Centre is referring to both, OCC and BCC and all the MMIs which need to be provided at OCC as mentioned in appendix H has to be provided at BCC as well. Kindly confirm if our understanding is correct.	Bidders understanding is correct
591	H	Position Crew control room at the end of line	Kindly clarify the locations of terminal rooms in NMRCL network	Please refer Drawings of the station for tentative location .
592	H	Head Quarter Security controller Room	As per Chapter 9 – FOTS, clause 9.1.3.4.5, NMRCLHeadquarter Building will be in OCC or BCC. Kindly clarify if the Security controller room for NMRCL HQ and OCC are the same.	NMRCL BCC will be stiuated in Headquarter Building Security controller room for NMRCL HQ and BCC are the same.
593	V	Key dates : KD1-7 or Key dates 1-9 ?	This is different from the one indicated in PART-III- Section-IX (Particular Conditions Of Contract), PART-B Table: Summary of Sections (KEY DATES) Kindly confirm which one to follow	Kindly refer to Corrigendum/Addendum, Item No 259

PART A Pre Bid Minutes

Part II		Section VIIC Appendix D (System Network drawings)		
594	D3	Integration of SMS with CCTV	SMS – is not defined in spec, pl. clarify the purpose for integration with CCTV?	These are schematic drawing for understanding
595	D4	Integration of PABX with CCTV	PABX – Pl. clarify purpose for integration with CCTV?	
596	D5	Integration of AFC with CCTV	Pls clarify the interconnection for Soft/Hard points	
597	D6	Integration of CTFRS with CCTV	CTFRS – we understand that CTFRS is part of T-SCADA however it is not shown in T-SCADA as interface in schematic, pl. confirm	
PART-III-		Section-VIII General Conditions Of Contract		
598	1.14	Joint and Several Liability	Being partner as a sub-contractor is not possible	Provision of clause is self explanatory
599	NIL		Is there any AMC period involved for the subject tender?	AMC is not in the scopeKindly Refer to PartII GS Clause 3.7.8
600	1.14	Joint and Several LiabilityIf the Contractor constitutes (under applicable Laws) a joint venture, consortium or other unincorporated grouping of two or more persons: (a) these persons shall be deemed to be jointly and severally liable to the Employer for the performance of the Contract; (b) these persons shall notify the Employer of their leader who shall have authority to bind the Contractor and each of these persons; and (c) the Contractor shall not alter its composition or legal status without the prior consent of the Employer.	If the Contractor constitutes (under applicable Laws) a joint venture, consortium or other unincorporated grouping of two or more persons: (a) these persons shall be deemed to be solely and independently jointly and severally liable to the Employer for the performance of the Contract;(b) these persons shall notify the Employer of their leader who shall have authority to bind the Contractor and each of these persons; and (c) the Contractor shall not alter its composition or legal status without the prior consent of the Employer.	Bidder request declined. Provision of tender clause will prevail.
601	2.1	Right of Access to the Site	All the milestones which in work-in-progress has to be paid for as the same is complete and accepted. Further if there is a delay for more than 30days contractor will terminate the contract and to be paid for the partial work completed and products delivered as on the date of termination	Bidder request declined. Provision of tender clause will prevail.
602	3.1		Bidder request for below addition as highlighted below. “Notwithstanding anything else in this contract, the Contractor acknowledges and accepts the role of the Engineer however Employer agrees that the Engineer will act fairly, independently and impartially and be fair and honest in the powers given to him under the contract.In the event that the Engineer has not acted in accordance with the above, then his decisions or opinions cannot be regarded as final and binding and in such circumstances the contractor shall have recourse to the dispute resolution provision under the contract.”	Bidder request declined. Provision of tender clause will prevail. Provision for dispute resolution is covered under clause 20 of GCC
603	3.7.8	AMC Management Plan (If applicable)	We assume AMC and DLP are same. If not please confirm if AMC needs to be considered after DLP period and if so for how many years.	AMC is not in the scope
604	4.2	The Contractor shall deliver the Performance Security to the Employer within 28 days after receiving the Letter of Acceptance, and shall send a copy to the Engineer	The Contractor shall deliver the Performance Security to the Employer within 28 days of execution of contract between the parties,and shall send a copy to the Engineer	Bidder request declined. Provision of tender clause will prevail.
605	4.4 d	each subcontract shall include provisions which would entitle the Employer to require the subcontract to be assigned to the Employer under Sub-Clause 4.5 [Assignment of Benefit of Subcontract] (if or when applicable) or in the event of termination under SubClause 15.2 [Termination by Employer]	Request to delete "each subcontract shall include provisions which would entitle the Employer to require the subcontract to be assigned to the Employer under Sub-Clause 4.5 [Assignment of Benefit of Subcontract] (if or when applicable) or in the event of termination under SubClause 15.2 [Termination by Employer]"	Bidder request declined. Provision of tender clause will prevail.
606	4.5	If a Subcontractor’s obligations extend beyond the expiry date of the relevant Defects Notification Period and the Engineer, prior to this date, instructs the Contractor to assign the benefit of such obligations to the Employer, then the Contractor shall do so.	If a Subcontractor’s obligations extend beyond the expiry date of the relevant Defects Notification Period and the Engineer, prior to this date, instructs the Contractor to assign the benefit of such obligations to the Employer, then the Contractor shall do so to the extent commercially feasible.	Bidder request declined. Provision of tender clause will prevail.
607	4.13	Rights of Way and Facilities Unless otherwise specified in the Contract the Employer shall provide effective access to and possession of the Site including special and/or temporary rights-of-way which are necessary for the Works. The Contractor shall obtain, at his risk and cost, any additional rights of way or facilities outside the Site which he may require for the purposes of the Works.	Please confirm if the payments made to any relevant government authorities as statutory charges including restoration if levied by the concerned authorities to grant ROW permission shall be reimbursed extra at actual	kindly refer to Part III section VII GCC Clause. 4.13 & 14.1, & Section IX (PC) clause 53, which are self explanatory

PART A Pre Bid Minutes

608	4.19	Electricity, Water and Gas: The quantities consumed and the amounts due (at these prices) for such services shall be agreed or determined by the Engineer in accordance with Sub-Clause 2.5 [Employer's Claims] and Sub-Clause 3.5 [Determinations]. The Contractor shall pay these amounts to the Employer.	We understood from Clause 15 of Particular conditions that Traction power shall be given by the employer free of charge (FOC).	Bidders understanding is correct
609	6.9	The Contractor's Personnel shall be appropriately qualified, skilled and experienced in their respective trades or occupations. The Engineer may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the Contractor's Representative if applicable, who:	The Contractor's Personnel shall be appropriately qualified, skilled and experienced in their respective trades or occupations. The Engineer may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the Contractor's Representative if applicable, who is prima facie is guilty of any corrupt or fraudulent act. If appropriate, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person	Bidder request declined. Provision of tender clause will prevail.
610	7.5	7.5 Rejection	The maximum amount recoverable from contractor shall not be more than 10% of the contract value of such material	Bidder request declined. Provision of tender clause will prevail.
611	7.6	7.6 Remedial Work	The maximum amount recoverable from contractor shall not be more than 10% of the contract value of such material	Bidder request declined. Provision of tender clause will prevail.
612	8.6	8.6 Rate of Progress	The maximum amount recoverable from contractor shall not be more than 10% of the contract value of such material	Bidder request declined. Provision of tender clause will prevail.
613	11.2	Remedying Defects All work referred to in sub-paragraph (b) of Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects] shall be executed at the risk and cost of the Contractor, if and to the extent that the work is attributable to:	Remedying Defects All work referred to in sub-paragraph (b) of Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects] shall be executed at the risk and cost of the Contractor subject to a maximum of 5% of the difference in cost of procurement, if and to the extent that the work is attributable to:	Bidder request declined. Provision of tender clause will prevail.
614	11.4	If the Contractor fails to remedy any defect or damage within a reasonable time, a date may be fixed by (or on behalf of) the Employer, on or by which the defect or damage is to be remedied. The Contractor shall be given reasonable notice of this date. If the Contractor fails to remedy the defect or damage by this notified date and this remedial work was to be executed at the cost of the Contractor under Sub-Clause 11.2 [Cost of Remedying Defects], the Employer may (at his option): (a) carry out the work himself or by others, in a reasonable manner and at the Contractor's cost, but the Contractor shall have no responsibility for this work; and the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay to the Employer the costs reasonably incurred by the Employer in remedying the defect or damage; (b) require the Engineer to agree or determine a reasonable reduction in the Contract Price in accordance with SubClause 3.5 [Determinations]; or (c) if the defect or damage deprives the Employer of substantially the whole benefit of the Works or any major part of the Works, terminate the Contract as a whole, or in respect of such major part which cannot be put to the intended use. Without prejudice to any other rights, under the Contract or otherwise, the Employer shall then be entitled to recover all sums paid for the Works or for such part (as the case may be), plus financing costs and the cost of dismantling the same, clearing the Site and returning Plant and Materials to the Contractor.	If the Contractor fails to remedy any defect or damage within a reasonable time, a date may be fixed by (or on behalf of) the Employer, on or by which the defect or damage is to be remedied. The Contractor shall be given reasonable notice of this date. If the Contractor fails to remedy the defect or damage by this notified date and this remedial work was to be executed at the cost of the Contractor under Sub-Clause 11.2 [Cost of Remedying Defects], the Employer may (at his option): (a) carry out the work himself or by others, in a reasonable manner and at the Contractor's cost, but the Contractor shall have no responsibility for this work; and the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay to the Employer the costs reasonably incurred by the Employer in remedying the defect or damage subject to a maximum of 5% of the value of difference in cost of procurement of such deliverables; (b) require the Engineer to agree or determine a reasonable reduction in the Contract Price in accordance with SubClause 3.5 [Determinations]; or (c) if the defect or damage deprives the Employer of substantially the whole benefit of the Works or any major part of the Works, terminate the Contract as a whole, or in respect of such major part which cannot be put to the intended use. Without prejudice to any other rights, under the Contract or otherwise, the Employer shall then be entitled to recover all sums paid for the Works or for such part (as the case may be), plus financing costs and the cost of dismantling the same, clearing the Site and returning Plant and Materials to the Contractor.	Bidder request declined. Provision of tender clause will prevail.
615	12.3	Evaluation	This should be mutually discussed and the rate should be fixed mutually	Request Declined. Existing Clause will prevail.

PART A Pre Bid Minutes

616	13.2	13.2 Value Engineering	In case of change in quantity/work the change in rate should be agreed mutually	Request Declined. Existing Clause will prevail.
617	13.7	The Contract Price shall be adjusted to take account of any increase or decrease in Cost resulting from a change in the Laws of the Country (including the introduction of new Laws and the repeal or modification of existing Laws) or in the judicial or official governmental interpretation of such Laws, made after the Base Date, which affect the Contractor in the performance of obligations under the Contract.	We understand that The Changes in Legislation clause mentioned in Particular Conditions (Clause 13.7) will be read in addition to The Changes in Legislation clause mentioned in General Conditions (Clause 13.7). Which means that Change in legislation will be applicable for all the Laws of the Country (including the introduction of new Laws and the repeal or modification of existing Laws). It will not be limited to Custom Duty, Excise Duty and Sales Tax (VAT or CST as applicable). Please confirm our understanding.	Bidders understanding is correct
618	13.8	Adjustments for Changes in Cost	Whether this clause is applicable to this contract	PVC is not applicable,
619	14.7	14.7 Payment	All invoices submitted by the contractor shall be paid within 30days from the date of receipt of invoice	kindly refer to Part III section VII GCC Clause 14.3, which is self explanatory.
620	15.2	(a) fails to comply with Sub-Clause 4.2 [Performance Security] or with a notice under Sub-Clause 15.1 (b) abandons the Works or otherwise plainly demonstrates the intention not to continue performance of his obligations under the Contract,	(a) fails to comply with Sub-Clause 4.2 [Performance Security] or with a notice under Sub-Clause 15.1 (b)without reasonable cause,abandons the Works or otherwise plainly demonstrates the intention not to continue performance of his obligations under the Contract,	Bidder request declined. Provision of tender clause will prevail.
621	15.3	15.3 Valuation at Date of Termination	All the work completed and goods delivered till the date of the termination has to be paid	Bidder request declined. Provision of tender clause will prevail.
622	15.4	Termination After a notice of termination under Sub-Clause 15.2 [Termination by Employer] has taken effect, the Employer may: (a) proceed in accordance with Sub-Clause 2.5 [Employer's Claims],	Termination After a notice of termination under Sub-Clause 15.2 [Termination by Employer] has taken effect, the Employer may: (a) proceed in accordance with Sub-Clause 2.5 [Employer's Claims], The Contractor shall be paid for all the goods delivered and services rendered till the effective date of termination.	Bidder request declined. Provision of tender clause will prevail.
623	15.4	15.4 Payment after Termination	The maximum amount recoverable from contractor shall not be more than 10% of the contract value of such material And further after the recovery contractor shall be paid for the work executed and products delivered till the date of termination as per the agreed contract value	Bidder request declined. Provision of tender clause will prevail.
624	15.5	The Employer shall be entitled to terminate the Contract, at any time for the Employer's convenience, by giving notice of such termination to the Contractor. The termination shall take effect 28 days after the later of the dates on which the Contractor receives this notice or the Employer returns the Performance Security. The Employer shall not terminate the Contract under this Sub-Clause in order to execute the Works himself or to arrange for the Works to be executed by another contractor or to avoid a termination of the Contract by the Contractor under Clause 16.2 [Termination by Contractor].	The Employer shall be entitled to terminate the Contract, at any time for the Employer's convenience, by giving notice of such termination to the Contractor. The termination shall take effect 90days after the later of the dates on which the Contractor receives this notice or the Employer returns the Performance Security. The Employer shall not terminate the Contract under this Sub-Clause in order to execute the Works himself or to arrange for the Works to be executed by another contractor or to avoid a termination of the Contract by the Contractor under Clause 16.2 [Termination by Contractor].	Bidder request declined. Provision of tender clause will prevail.
625	17.1	Sub-clause 17.1 – Indemnities The Contractor shall indemnify and hold harmless the Employer (NMRCL), the Engineer, the Designated Contractors, representatives and employees from and against all actions, suits, proceedings, claims, damages, losses, expenses and demands of every nature and description, by reasons of any act or omissions of the Contractor, his representative or his employees in the execution of the Works, including professional services provided by the Contractor or in the guarding the same.	The Contractor shall indemnify and hold harmless the Employer, the Employer's Personnel, and their respective agents, against and from any third party claims, damages, losses and expenses (including legal fees and expenses) in respect of: Bidder request for below addition. "Indemnity provision shall be subject to the Limitation of Liability in Clause 17.6"	Bidder request declined. Provision of tender clause will prevail.

PART A Pre Bid Minutes

626	17.5	The Contractor shall indemnify and hold the Employer harmless against and from any other claim which arises out of or in relation to (i) the manufacture, use, sale or import of any Goods, or (ii) any design for which the Contractor is responsible.	The Contractor shall indemnify and hold the Employer harmless against and from any other third party claim which arises out of or in relation to (i) Deleted (ii) any registered industrial design for which the Contractor is responsible.	Bidder request declined. Provision of tender clause will prevail.
627	17.6	<p>Clause 17.6 Limitation of Liability</p> <p>Neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contract or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract, other than as specifically provided in Sub-Clause 8.7 [Delay Damages]; Sub-Clause 11.2 [Cost of Remedying Defects]; Sub-Clause 15.4 [Payment after Termination]; Sub-Clause 16.4 [Payment on Termination]; Sub-Clause 17.1 [Indemnities]; Sub-Clause 17.4(b) [Consequences of Employer's Risks] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights].</p> <p>The total liability of the Contractor to the Employer, under or in connection with the Contract other than under Sub-Clause 4.19 [Electricity, Water and Gas], Sub-Clause 4.20 [Employer's Equipment and Free-Issue Materials], Sub-Clause 17.1 [Indemnities] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights], shall not exceed the sum resulting from the application of a multiplier (less or greater than one) to the Accepted Contract Amount, as stated in the Contract Data, or (if such multiplier or other sum is not so stated) the Accepted Contract Amount.</p> <p>This Sub-Clause shall not limit liability in any case of fraud, deliberate default or reckless misconduct by the defaulting Party.</p>	<p>The total liability of the Contractor to the Employer, under or in connection with the Contract other than under Sub-Clause 4.19 [Electricity, Water and Gas], Sub-Clause 4.20 [Employer's Equipment and Free-Issue Materials], Sub-Clause 17.1 [Indemnities] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights], shall not exceed the annual Contract Amount. This Sub-Clause shall not limit liability in any case of fraud, deliberate default or reckless misconduct resulting in death or personal injury solely and directly attributable to the defaulting Party.</p> <p>Limit the liability to total contract value</p> <p>Our understanding is that Liability for this Project is limited to 100% Of the Contract Value. Please confirm.</p> <p>Bidder request for below addition as highlighted</p> <p>Contractor's total liability to the Employer over the period of the Agreement arising out of or in connection with the Agreement, whether such liability arises from any claim based upon contract, warranty, tort or otherwise, shall in no case exceed the contract value.</p> <p>In no event shall Contractor be liable for any incidental damages, consequential damages, special damages, indirect damages, loss of profits, loss of revenues, or loss of use, these limitations and exclusions will apply regardless of whether liability arises from breach of contract, warranty, tort (including but not limited to negligence), by operation of law, or otherwise.</p> <p>Contractor's liability under the Agreement will (including in respect of any indemnity) be reduced to the extent to which the Employer or a third party (not engaged by the SI) has caused or contributed to such liability.</p> <p>For the avoidance of doubt, the Contractor is not liable for loss or damage caused by vandalism, a force majeure event such as fire, flood, acts of God or terrorism or other events outside of its reasonable control and Contractor is not responsible for any loss or liability caused by a third party (not engaged by the Contractor) including a failure of any third party communication system which the Contractor is reliant upon.</p>	<p>Bidder request declined. Provision of tender clause will prevail.</p> <p>Clause is self explanatory</p> <p>Bidder request declined. Provision of tender clause will prevail.</p>
628	18.2 (b)	shall be in the joint names of the Parties, who shall be jointly entitled to receive payments from the insurers, payments being held or allocated to the Party actually bearing the costs of rectifying the loss or damage,	<p>In case of insurance for works, the Employer can only be noted as 'additional joint insured' as the Risk is with the Contractor until handover of completed works. Hence we are requesting that employer cannot be entitled to receive insurance proceeds.</p> <p>Request you to modify the language highlighted accordingly.</p>	Bidder request declined. Provision of tender clause will prevail.
629	18.3 (c)	shall be extended to cover liability for all loss and damage to the Employer's property (except things insured under Sub-Clause 18.2) arising out of the Contractor's performance of the Contract, and	Clarification : This coverage will be included in the CAR policy required under clause 18.2 (b) as per the standard CAR policy schedule.	Clause is self explanatory. Bidder request declined. Provision of tender clause will prevail.
630	20.3	<p>If any of the following conditions apply, namely : -</p> <p>then the appointing entity or official named in the Contract Data shall, upon the request of either or both of the Parties and after due consultation with both Parties, appoint this member of the DB. This appointment shall be final and conclusive. Each Party shall be responsible for paying one-half of the remuneration of the appointing entity or official.</p>	<p>If any of the following conditions apply, namely : -</p> <p>Deleted</p>	Bidder request declined. Provision of tender clause will prevail.
931		Clause 20.3 Failure to Agree on the Composition of the Dispute Board read together with Point 56 of the Contract Form	Bidder request for mutual appointment of composition of the Dispute Board.	Bidder request declined. Provision of tender clause will prevail.

PART A Pre Bid Minutes

Contract Data			
632	5	Refer to Table: Summary of Sections below i.e. 182 weeks	Kindly refer to Corrigendum/Addendum, Item No 260
633	6	Defects Notification Period (Defect Liability Period)24 months from the date of issue of Taking Over Certificate for work or section/sections. During the Defects Notification Period the Contractor shall provide, free of cost, competent and skilled personnel and maintain adequate stock of spares so as to promptly fulfill his obligations during the Defects Notification Period as laid down in GC and Employer's Requirements.	In case, Taking Over Certificate of the last section is delayed due to no fault of Bidder, The Defect Liability Period will start from original scheduled completion date as per contract and continue up to 24 months. Similarly, if Taking Over Certificate is delayed 3 months beyond date of commissioning, the Defect Liability Period shall start immediately after completion of 3 months from date of Commissioning.
634	7	Sections	Kindly refer to Corrigendum/Addendum, Item No 262
635	18	Refer to Table: Summary of Sections below	Kindly refer to Corrigendum/Addendum, Item No263
636	30	Liquidated Damages (LD) for delays in achievement of Key Dates (Major and Minor Key Dates as defined in „Table – Summary of Sections (Key Dates) below will be applicable as noted below:	Bidder request for below addition Contractor shall not be liable for any delays or increased cost not attributable to Contractor. If Employer caused delay occurs, then the price and other affected terms will be adjusted to reflect increased costs, delay, and other adverse impact suffered by Contractor. For the avoidance of doubt, Liquidated Damages shall not be applicable during such delay
637	36	Refer PC Part B – Clause No. 52	Kindly refer to Corrigendum/Addendum, Item No 265
638	37	Refer PC Part B – Clause no. 53	Kindly refer to Corrigendum/Addendum, Item No 266
639	45	As provided for in PC Part B– Clause No. 57	Kindly refer to Corrigendum/Addendum, Item No 267
640	50	INR 0.50 Million for any one incident, with no. of incidents unlimited	Clarification: As per the standard CAR policy issued in India, there is only a provision of Third party liability coverage at 10% of Policy sum insured, per occurrence and in the aggregate.
641	51	Amount of Professional Indemnity Insurance (PII)	Kindly refer to Corrigendum/Addendum, Item No 268
PART-III Section-IX Particular Conditions of Contract			
642	6	Notwithstanding any other provision of the Contract: (a) submission by the Contractor of the requisite Performance security, parent company Undertakings and written Guarantees shall be condition precedent to the Contractor's entitlement to any payment, under the Contract; and (b) failure by the Contractor to provide a Performance security or parent company Undertakings or parent company Guarantees shall entitle the Employer either to suspend the Works or to terminate the Contract forthwith by notice in writing to that effect, notwithstanding that the Contractor may have been to proceed with the Works, and the Contractor shall not be compensation whatsoever as a consequence of such suspension or termination The forms of Contractor warranty shall be in the format given in the Section X: Contract Forms.	Kindly modify the Clause: Notwithstanding any other provision of the Contract: (a) submission by the Contractor of the requisite Performance security, shall be condition precedent to the Contractor's entitlement to any payment, under the Contract; and (b) failure by the Contractor to provide a Performance security shall entitle the Employer either to suspend the Works or to terminate the Contract forthwith by notice in writing to that effect, The forms of Contractor warranty shall be in the format given in the Section X: Contract Forms.

PART A Pre Bid Minutes

643	22	<p>Sub-clause 5A.2, Contractor's warranty of design</p> <p>b. The Contractor warrants that the Contractor's Proposals meet the Works Requirements and is fit for the purpose thereof. Where there is any inadequacy, insufficiency, impracticality or unsuitability in or of the Works Requirements or any part thereof, the Contractor's Proposal shall take into account, address or rectify such inadequacy, insufficiency, impracticality or unsuitability at Contractor's own cost.</p>	<p>Bidder request for below addition as highlighted below.</p> <p>"The Contractor warrants that the Contractor's Proposals meet the specifications as set out in the RFP. Where there is any inadequacy, insufficiency, impracticality or unsuitability in or of the Works Requirements or any part thereof, the Contractor's Proposal shall take into account, address or rectify such inadequacy, insufficiency, impracticality or unsuitability at Contractor's own cost"</p> <p>We bidder read as "Fit for Purpose" is w.r.t Technical requirement as mentioned in the TENDER NO. N1TL01/2016"PARTII Section VII A General Specification" & "PART II Section VII B Works Requirement" Fit to Purpose / System functioning is generally subjected to the technical required of the project</p>	<p>Bidder request declined. Provision of tender clause will prevail.</p> <p>Bidders Understanding is correct. Bidder may propose specific suggestions in the Technical Proposal as per the Work's Requirement</p>
644	31	<p>The Contractor shall indemnify the Employer and the Engineer from and against all claims and proceedings on account of infringement (or alleged infringement) of any patent rights, registered designs, copyright, design, trademark, trade name, knowhow or other intellectual property rights in respect of the Works, Contractor's Equipment, machines, work method, or Plant, or Materials, or anything whatsoever required for the Works and from and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto. The Contractor shall pay all traffic surcharges and other royalties, licence fees, rent and other payments or compensation, if any, for getting stone, sand, gravel, clay or other materials, machine, process, systems, work methods, or Contractor's Equipment required for the Works. The Contractor shall, in the event of infringement of Intellectual Property Rights, rectify, modify or replace at his own cost the Works, Plant or materials or anything whatsoever required for the Works so that infringement no more exist or in the alternative shall procure necessary rights/license so that there is no infringement of Intellectual Property Rights.</p>	<p>Bidder request for below addition.</p> <p>"Contractor hereby grants to Employer a non-exclusive, non-sub licensable and perpetual license and right to use the deliverables, formats, material and the documentation solely for the Employer's own internal business operations as set forth under the this Agreement. Contractor's software license under this Agreement does not include the right to (a) sell, lease, exchange, mortgage, pledge, license, sub-license, assign or in any other way convey, transfer or alienate SI property in favour of any person (either for commercial consideration or not (including by way of transmission) and/or (b) reverse compile or in any other way arrive at or attempt to arrive at the source code of the Contractor property. All the software licenses and warranties pertaining to any software and/or hardware supplied under this agreement shall be as per Contractor's license terms and conditions and/or End User License Agreement. In case of any hardware supplied under this Agreement it shall be as per the Original Equipment Manufacturer terms and conditions. Except these terms and conditions no other terms and conditions shall be applicable to the supplied software and/or hardware even if mentioned on the Order, tender document or any agreement signed between the parties.</p> <p>Contractor will have no obligation or liability with respect to: (a) Equipment or Licensed Software provided pursuant to Customer's designs, drawings or manufacturing specifications; (b) Equipment or Licensed Software used other than for its ordinary purpose; (c) claims of infringement resulting from combining any Equipment or Licensed Software furnished hereunder with any article not furnished by Contractor; or (e) any modification of the Equipment or Licensed Software other than a modification by Contractor.</p> <p>The Contractor shall indemnify the Employer and the Engineer from and against all claims and proceedings on account of infringement (or alleged infringement) of any patent rights, registered designs, copyright, design, trademark, trade name, knowhow or other intellectual property rights in respect of the Works, Contractor's Equipment, machines, work method, or Plant, or Materials, or anything whatsoever required for the Works and from and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto. The Contractor shall pay all traffic surcharges and other royalties, licence fees, rent and other payments or compensation, if any, for getting stone, sand, gravel, clay or other materials, machine, process, systems, work methods, or Contractor's Equipment required for the Works. The Contractor shall, in the event of infringement of Intellectual Property Rights, rectify, modify or replace at his own cost the Works, Plant or materials or anything whatsoever required for the Works so that infringement no more exist or in the alternative shall procure necessary rights/license so that there is no infringement of Intellectual Property Rights.</p>	<p>Bidder request declined. Provision of tender clause will prevail.</p>

PART A Pre Bid Minutes

645	36	<p>Contractor warrants that :-</p> <p>a. The Contractor shall be fully responsible, for the suitability, adequacy, integrity, durability and practicality of the Contractor's proposal.</p> <p>b. The Contractor warrants that the Contractor's Proposals meet the Work's Requirements and is fit for the purpose thereof. Where there is any inadequacy, insufficiency, impracticality or unsuitability in or of the Work's Requirements or any part thereof, the Contractor's Proposal shall take into account, address or rectify such inadequacy, insufficiency, impracticality or unsuitability at Contractor's own cost.</p> <p>c. The Contractor warrants that the Works have been or will be designed, manufactured, installed and otherwise constructed and to the highest standards available using proven up-to-date good practice</p> <p>d. The Contractor warrants that the Works will, when completed, comply with enactments and regulations relevant to the Works</p> <p>e. The Contractor warrants that the design of the Works and the manufacture of plant have taken or will have taken full account of the effects of the intended manufacturing and installation methods, Temporary Works and Contractor's Equipment</p> <p>f. The Contractor shall also provide a guarantee from the Designer for the design for suitability, adequacy, practicality of design for Work's Requirements</p> <p>g. The Contractor shall indemnify the Employer against any damage, expense, liability, loss or claim, which the Employer might incur, sustain or be subject to arising from any breach of the Contractor's design responsibility and/or warranty</p>	<p>Modify to :</p> <p>Contractor warrants that :-</p> <p>a. The Contractor shall be fully responsible, for the suitability, adequacy, integrity, durability and practicality of the Contractor's proposal.</p> <p>b. Deleted</p> <p>c. The Contractor warrants that the Works have been or will be designed, manufactured, installed and otherwise constructed and to the commercially feasible highest standards available using proven up-to-date good practice</p> <p>d. The Contractor warrants that the Works will, when completed, comply with enactments and regulations relevant to the Works</p> <p>Deleted</p>	<p>Bidder request declined. Provision of tender clause will prevail.</p>
646	39	<p>Replace the GC Sub-Clause 7.7 with provisions as under:</p> <p>The plant, goods and material not finally taken over as per GC Clause 10 but payment against which have been made in part or full against Indemnity Bond / Safety 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.</p>	<p>Title of the Plant and Materials manufactured or sourced outside of India shall pass to the Employer once the equipment passes over the ships; rail/entered the airplane in the country of origin (FOB). Other conditions of the tender/contract will remain unchanged. Once the goods have been imported into India, the bill of entry shall be filed in the name of the Employer by the Contractor. The Contractor will undertake all the formalities at this stage such as but not limited to presentation of the bill of entry before the custom authorities. Liaising with customs authorities and payment of customs duty. The Employer will be the owner of the equipment once it passes overseas but the Contractor will bear all the risk including but not limited to transportation, handling, insurance etc. according to the terms conditions of the tender document will provide all relevant documents to the employer.</p> <p>Risk and title to goods shall be transferred on delivery. Contractor will take care of the same till the final acceptance as a custodian to such goods</p>	<p>Bidder request declined. Provision of tender clause will prevail.</p> <p>Provision of clause is self explanatory</p>

PART A Pre Bid Minutes

647	49	<p>If the Contractor fails to remedy any defect or damage within such time as the Employer / Engineer may deem to be reasonable, the Employer or the Engineer may fix a date on or by which to remedy the defect or damage, and give the Contractor reasonable notice of such date. If the Contractor fails to remedy the defect or damage by such date and the necessity for such work is due to a cause stated in Sub-Clause 11.2(a), (b) or (c), the Employer may (at his sole discretion):</p> <p>(a) carry out the work himself or by others, in a reasonable manner and at the Contractor's risk and cost, but the Contractor shall have no responsibility for such work: the costs incurred by the Employer in remedying the defect or damage shall be recoverable from the Contractor by the Employer;</p> <p>(b) require the Engineer to determine and certify a reasonable reduction in the Contract Price; or</p> <p>(c) if the defect or damage is such that the Employer has been deprived of substantially the whole of the benefit of the Works or parts of the Works, terminate the Contract in respect of such parts of the Works as cannot be put to the intended use, the Employer shall then be entitled to recover all sums paid for such parts of the Works together with the cost of dismantling the same, clearing the Site and returning Plant, Rolling Stock and Materials to the Contractor, and Sub-Clause 13 shall not apply</p>	<p>If the Contractor fails to remedy any defect or damage within such time as the Employer / Engineer may deem to be reasonable, the Employer or the Engineer may fix a date on or by which to remedy the defect or damage, and give the Contractor reasonable notice of such date. If the Contractor fails to remedy the defect or damage by such date and the necessity for such work is due to a cause stated in Sub-Clause 11.2(a), (b) or (c), the Employer may (at his sole discretion):</p> <p>(a) carry out the work himself or by others, in a reasonable manner and at the Contractor's risk and cost, but the Contractor shall have no responsibility for such work: the costs incurred by the Employer in remedying the defect or damage shall be recoverable from the Contractor by the Employer subject to a maximum of 5% of the value of difference in cost of procurement of such deliverables; (b) require the Engineer to determine and certify a reasonable reduction in the Contract Price; or (c) if the defect or damage is such that the Employer has been deprived of substantially the whole of the benefit of the Works or parts of the Works, terminate the Contract in respect of such parts of the Works as cannot be put to the intended use,</p>	Bidder request declined. Provision of tender clause will prevail.
648	50	<p>In the event of the Engineer and the Contractor failing to reach agreement on the revisions to be made to the Cost Centre Amounts, the Engineer shall, with the approval of the Employer, determine the amount which should be added or deducted from the relevant cost centre amount which shall be binding on the contractor. In case the Contractor supplies part/ incomplete information or refuses to supply the required information, Engineer shall determine the cost of Variation based on the information available to him from any sources which in his judgment can be used to determine the case. The Contractor shall proceed with the Work irrespective of whether an agreement between the Engineer and Contractor as to the terms and price of the variation have been reached or not but may submit his Claim if necessary, in accordance with Sub-clause 20 of GCC.</p>	<p>In the event Engineer and Contractor fail to reach an agreement, the Contractor shall not be bound to continue provision of services, and the Engineer may seek a replacement service provider to execute such work.</p>	Bidder request declined. Provision of tender clause will prevail.
649	52	Adjustment in Price		Kindly refer to Corrigendum/Addendum, Item No 269
650	53	Contract Price	<p>Our understanding is that materials will be imported using the IEC code of Nagpur Metro Rail to avail project import benefit. Please confirm.</p> <p>Please clarify whether High Sea Sale Transaction shall be applicable to the imported items.</p> <p>a) If acceptable, the various documents which are required for High sea transaction like High Sea Sale Agreement, Declaration, Endorsement requirement etc. will be done in the name of NMRCL</p> <p>b) Further, inn case of High Sea Sale transaction, the cenvat of CVD, SAD and Cess is not available. Request you to kindly clarify whether in case of such high sea sale transaction, the whole of duties including Custom Duty, CVD, SAD and Cess paid by the contractor shall be reimbursed</p> <p>Kindly clarify whether Form C will be issued by Employer.</p>	<p>Above is part of after award formalities</p> <p>High Sea sale transaction is not applicable for this contract.</p> <p>No NMRCL will not issue Form C</p>

			<p>We believe that Indian Govt. has released a new notice regarding service tax in which Metro and Monorail projects coming into force after 01/03/2016 have been excluded from the service Tax exemption.</p> <p>Please confirm that Service Tax exemption will be applicable on this project (NIS-01/2016) as per Notification No. 25/2012 -Service Tax dated 20.06.2012.</p>	<p>Service tax exemption is not applicable presently, however if NMRCL is exempted from tax in future, benefit shall be passed on to NMRCL.</p>
			<p>Request for list of products approved/eligible for the concession duty benefits under Chapter 98.01 of custom Tariff Act for project Imports. Also & please indicate rate of Custom Duty and Excise duty applicabe</p>	<p>Details are already available in the public domain. Bidder to gather information accordingly.</p>
			<p>1) Please confirm 'Form C 'will be provided to Bidder for inter-state transaction. 2) Please confirm that statutory variation in Taxes and Duties / introduction of new Taxes/Duties / levies viz, GST shall be borne by Customer. 3) Please confirm whether Bid price will be inclusive of all Taxes and Duties for the purpose of evaluation. 4) Please confirm whether Taxes and Duties shall be reimbursed at actual or the same shall be included as part of the contract price. 5) Please clarify whether any exemption or concession in taxes and duties are applicable for this project. If so, please let us know relevant notification.</p>	<p>1. NMRCL will not provide form C. 2. . kindly refer to Part III Section VIII General condition of contract clause 13.7 along with Part III Section IX Particular condition of contract clause 51. which are self explanatory. 3. Yes Bid price will be inclusive of Taxes & duties. Kindly refer BDS ITB 14.7 4. Kindly refer to Part III Section VIII General condition of contract clause 13.7 along with Part III Section IX Particular condition of contract clause 51. which are self explanatory. 5. Kindly refer BDS ITB 14.16, which is self explanatory. 6. Kindly refer to Corrigendum/Addendum , Item No 270</p>
651	55	<p>Should there be delay in the progress and completion of work, as a result of which it is not possible to recover the advance and interest thereon, before the date of completion stipulated in the Contract, then the interest to be charged from the Contractor on the remaining portion of the advance beyond the original completion date specified in the Contract, shall be the State Bank of India Base Rate plus 3% per annum or 12% per annum, whichever is higher up to the date of actual recovery affected by the NMRCL.</p>	<p>Please clarify that interest will be charged from the N1TL01/2016 Contractor on the remaining portion of the advance beyond the original completion date specified in the Contract if and only if delay in the progress and completion of work is attributed to N1TL01/2016 contractor.</p> <p>If delay in the progress and completion of work is due to non-availability of site access or any other reason not attributable to N1TL01/2016 contractor then N1TL01/2016 contractor will not be penalized under this clause.</p>	<p>Kindly refer to Part III Section VIII, GCC Clause 4.12, 8.5 & 20.1 along with Section IX (PC) clause 3 which are self explanatory</p>
652	56	<p>All payments to the contractor for the foreign currency portion shall be through a Letter of Credit. All bank charges of Employer's Banker shall be borne by the Employer and that of Contractor's Banker shall be borne by the Contractor. The charges towards confirmation (if required by the Contractor) shall be borne by the contractor. Extension of validity of L/C need is not envisaged. However, should be validity of L/C need to be extended, forreasons solely attributable to Employer, the charges for such extension will be borne by the Employer. In all other cases, L/C charges for extension or otherwise shall be borne by the Contractor</p>	<p>Could you please confirm that the Letter of Credit shall be issued for 100% of the foreign Currency portion which shall also include the Advance Payment denominated in foreign currency?</p> <p>Could you please confirm that the Letter of Credit shall be issued with a validity covering all payment milestones?</p>	<p>Yes Letter of Credit will be issued for 100% of the foreign Currency portion.</p>

PART A Pre Bid Minutes

53	60	<p>The Employer shall have lien over all or any moneys that may become due and payable to the Contractor under the Contract, and / or over the deposit of Performance Security or other amount or amounts made under the Contract and which may become payable to the Contractor.</p> <p>Unless the Contractor pays and clears immediately on demand any claim of the Employer, the Employer shall at all times be entitled to deduct the amount of the said claim from the moneys, securities and / or deposits which may have become or will become payable to the Contractor under these presents, or under any other Contract or transaction whatsoever between the Employer and the Contractor even if the matter stands referred to Arbitration. The Contractor shall have no claim for any interest or damage whatsoever in respect of any amounts withheld or treated as withheld under the lien referred to above and duly notified as such to the Contractor</p>	Request deletion.	Bidder request declined. Provision of tender clause will prevail.
654	61	<p>All damages (including, without limitation, liquidated damages), costs, charges, expenses, debts, or sums for which the Contractor is liable to the Employer under any provision of the Contract may be deducted by the Employer from monies due to the Contractor under the Contract (including, without limitation, liquidated damages) and the Employer shall have the power to recover any balance not so deducted from monies due to the Contractor under any other contract between the Employer and the Contractor.</p> <p>When the Contractor has assigned to a third party the right to receive monies due, or, to become due, under the Contract to the Contractor or charged such monies in favour of a third party, the Employer's right to deduct damages (including without limitation liquidated damages), costs, charges, expenses, debts or sums for which the Contractor is liable to the Employer from monies due to the Contractor under the Contract shall be limited to the right expressed above.</p>	Request deletion.	Bidder request declined. Provision of tender clause will prevail.
655	69	<ul style="list-style-type: none"> - CAR policy to include Transit cover - Deductibles at 1% of value - Validity three months after expiry of DLP 	<p>> Bidder has a separate insurance program for transits so that coverage will not be included under our CAR policy.</p> <p>> Standard deductible on CAR policy is minimum 5% of the claim amount. Please delete any requirements related to deductibles. Honeywell's insurance will carry deductibles as per standard practice - These are anyways on Contractor's account.</p> <p>> A CAR policy stays force only until the handover of the works or as soon as any of the standard cover terminations conditions are triggered. There is a provision of Extended maintenance coverage upto 12 months. There will be no coverage beyond that point/</p>	Bidder request declined. Provision of tender clause will prevail.
656	70	Professional Indemnity Insurance	<p>REQUEST Deletion. As this would be relevant for a design only scope like an architect or consultant. Even if it applies, being a first party insurance policy, we cannot take coverage in name of any party other than Bidder. Provisions such as addition/ joint insured also will not be applicable. Also the period for which coverage needs to be maintained cannot be beyond 3 years from handover of the works.</p> <p>The key exposure for Design and Installation scope already gets covered under Third party liability insurance.</p>	Bidder request declined. Provision of tender clause will prevail. Kindly refer to Corrigendum/Addendum , Item No 271
657	74	Damage to manufacturer's property due to natural calamity.	<p>REQUEST Deletion. Contractor/ Bidder cannot insure any property not belonging to Contractor especially where the there is no connection/ contribution to the damages by the Contractor's scope.</p> <p>This exposure is also noted under Employer's Risk under clause 17.3 (h)</p> <p>Bidder cannot be held responsible for damages to any other party's property unless damages are directly resulting from Contractor's actions.</p>	Bidder request declined. Provision of tender clause will prevail.

PART A Pre Bid Minutes

658	75	<p>If the Contractor shall fail to carry out any work required under the Contract or refuse to comply with any instruction or order given by the Engineer in accordance with the Contract within a reasonable time, the Engineer may give the Contractor 14 days' notice in writing to carry out such work or comply with such instruction. If the Contractor fails to comply with such notice, the Employer shall be entitled to carry out such work or instruction by his own workmen or by other contractors.</p> <p>Without prejudice to any other right or remedy, all additional expenditure properly incurred by the Employer in having such work or instruction carried out shall be recoverable by the Employer from the Contractor. If by reason of any accident or failure or other event occurring to, in, or in connection with the Works any remedial or other work shall, in the opinion of the Engineer, be urgently necessary and the Contractor is unable or unwilling at once to do such remedial or other work, the Engineer may authorize the carrying out of such remedial or other work by a person other than the Contractor. If the remedial or other work so authorized by the Engineer is work, which, in the Engineer's opinion, the Contractor was liable to do under the Contract, all expenses properly incurred in carrying out the same shall be recoverable by the Employer from the Contractor. Provided that the Engineer shall, as soon after the occurrence of any such emergency as may be reasonably practicable, notify the Contractor thereof in writing.</p>	<p>If the Contractor shall fail to carry out any work required under the Contract in accordance with the Contract within a reasonable time, the Engineer may give the Contractor 14 days' notice in writing to carry out such work. If the Contractor fails to comply with such notice, the Employer shall be entitled to carry out such work or instruction by his own workmen or by other contractors. Without prejudice to any other right or remedy, all additional expenditure properly incurred subject to a maximum of 5% of such additional expenditure, by the Employer in having such work or instruction carried out shall be recoverable by the Employer from the Contractor. If by reason of any accident or failure or other event occurring to, in, or in connection with the Works any remedial or other work shall, in the opinion of the Engineer, be urgently necessary and the Contractor is unable or unwilling at once to do such remedial or other work, the Engineer may authorize the carrying out of such remedial or other work by a person other than the Contractor</p>	Bidder request declined. Provision of tender clause will prevail.
659	80	<p>Notwithstanding anything to contrary contained in the General Conditions of Contract, the Parties expressly agree that the aggregate "payment of any cost plus profit" ("Damages") payable under clauses 1.9, 2.1, 4.7, 7.4, 10.2, 10.3 and 16.1 shall not exceed 10% (Ten Percent) of the contract price. For the avoidance of doubt, the Damages payable by the Employer under the aforesaid clauses shall not be additive if they arrive concurrently from more than one cause but related to the same part of the project</p>	<p>Notwithstanding anything to contrary contained in the General Conditions of Contract, the Parties expressly agree that the aggregate "payment of any cost plus profit" ("Damages") payable under clauses 1.9, 2.1, 4.7, 7.4, 10.2, 10.3 and 16.1 shall not exceed 10% (Ten Percent) of the value of delayed deliverable contract price. For the avoidance of doubt, the Damages payable by the Employer under the aforesaid clauses shall not be additive if they arrive concurrently from more than one cause but related to the same part of the project</p>	Bidder request declined. Provision of tender clause will prevail.
Request for addition of clause by Bidder				
660		Savings Clause	Bidder's failure to perform its contractual responsibilities, to perform the services, or to meet agreed service levels shall be excused if and to the extent Bidder's performance is effected , delayed or causes non-performance due to Employer's omissions or actions whatsoever.	Bidders request declined, no new clause will be added
661		Deemed Acceptance	Services and/or deliverables shall be deemed to be fully and finally accepted by Employer in the event when Employer has not submitted its acceptance or rejection response in writing to Bidder within 15 days from the date of installation/commissioning or when Employer uses the Deliverable in its business, whichever occurs earlier. Parties agree that Bidder shall have 15 days time to correct in case of any rejection by Client.	Bidders request declined, no new clause will be added
662		Arbitration	This Agreement shall be governed by laws in force in India. In the event of any dispute arising out of this Agreement the same shall be settled by binding arbitration conducted by a sole arbitrator appointed jointly by both Parties and governed by the Arbitration and Conciliation Act, 1996. The venue of arbitration shall be Delhi. The language of the arbitration proceedings shall be English. Any dispute arising in relation to this Agreement shall be subject to the jurisdiction of the courts at Delhi.	Bidders request declined, no new clause will be added
663		Change Orders	Either party may request a change order ("Change Order") in the event of actual or anticipated change(s) to the agreed scope, Services, Deliverables, schedule, or any other aspect of the Statement of Work. Bidder will prepare a Change Order reflecting the proposed changes, including the impact on the Deliverables, schedule, and fee. In the absence of a signed Change Order, Bidder shall not be bound to perform any additional services.	Bidders request declined, no new clause will be added

PART A Pre Bid Minutes

664		Intellectual Protection	No intellectual property rights of any nature shall be transferred from one party to the other in the course of performing any obligations or otherwise under this agreement. For the avoidance of doubt, Bidder may use certain tools, processes or methodologies of its own in performing the Services. Ownership of all intellectual property rights and any other rights in these shall vest with Bidder, and no rights shall be deemed to have accrued to the Employer.	Bidders request declined, no new clause will be added
665		PRICE FALL CLAUSE	to be deleted	Bidders request declined, no new clause will be added
666		31. Suspension, Cancellation & Foreclosure of Rental Contract	Either Party may terminate any SOW and/or the entire Agreement upon written notice to the other in the event that: (a) the other Party commits a material breach of the Agreement or SOW and fails to cure such default to the non-defaulting Party's reasonable satisfaction within thirty (30) days after receipt of notice; or (b) the other Party becomes insolvent or bankrupt, assigns all or a substantial part of its business or assets for the benefit of creditors, permits the appointment of a receiver for its business or assets, becomes subject to any legal proceeding relating to insolvency or the protection of creditors' rights or otherwise ceases to conduct business in the normal course. In the event of termination of an SOW hereunder, Employer shall pay Supplier: (1) all fees as specified in the SOW and expenses up to the effective date of the termination, including work in progress, plus fees for the applicable notice period irrespective of whether Employer requires Supplier's services during such period; and (2) any termination charges agreed by the Parties. If this Agreement is terminated before all SOWs executed hereunder are terminated or completed, the terms of this Agreement shall remain in full force until the termination or completion of such Statements of Work.	Bidders request declined, no new clause will be added
667		Audit	Request that the following be included: Excluding a regulatory/statutory requirement, if any, nothing in this Agreement shall be construed or interpreted as requiring Contractor to provide to Employer access to or right to inspect, examine, audit and take copies of any fees, price, cost or any other financial information or any records or documents relating to the make-up of the Contractor's internal overhead calculations, their relationship to the fees, any financial cost model, calculation of fees or to the Contractor's profitability or other such financial data.	Bidders request declined, no new clause will be added
668		Bidders right to terminate	The bidder shall have the right to terminate the contract in the event any undisputed amount remains unpaid for a period exceeding 30 days.	Bidders request declined, no new clause will be added
669		Non-hire	During the term of this Agreement and for a period of one year thereafter Employer shall not, directly or indirectly, hire or solicit for hire, any of the personnel engaged by Bidder, without the prior written consent thereof from Bidder. Thus, the Employer agrees to the entry of an injunction against it in the event of actual or threatened breach of its obligations hereunder, and acknowledges such relief shall be in addition to such other and further relief as may be available to Bidder at law or in equity	Bidders request declined, no new clause will be added
PC Part B Table: Summary of Sections (KEY DATES)				
670	NIL	Section IX	Please share the access dates for Priority section.	Kindly refer to Corrigendum/Addendum , Item No 272
671		The nominated Depot and Line for delivery and commissioning of Telecommunication System will be advised within 60 weeks of issuance of LOA.	We could not ascertain which section would be designated as the Priority section. We request you to modify the clause as below, "The nominated Depot and Line for delivery and commissioning of Telecommunication System will be advised within 8 weeks of issuance of LOA." Also we request you to properly define Priority Section and Reach 1-5.	Reach-wise & priority section details are indicatedKindly refer to corrigendum/addendum item No. 272
672			Bidder request for station wise TOC as per Key dates.	Reach wise key dates are indicated, based on above bidder may need to work out & indicate milestone in pricing schedule included in Annexure IV B

Part III –		Condition of Contract, Section XI, SHE Manual		
673	56.3(2) (1)	General Instruction: NMRCL/SHE/GI/001 - MINIMUM MANPOWER REQUIREMENTS OF SHE ORGANIZATION BASED ON CONTRACT VALUE	Number of SHE Manpower required is too high. For recent tenders like Noida Metro and Kochi metro, SHE Manpower requirement was reduced by the client for Signalling and Telecommunication Works (as attached for reference). The number of SHE manpower requirements in project should be on the basis of criticality and hazards involved and not on the value of the contract. As for Noida and Kochi, we recommend, following manpower for Telecommunication works <ul style="list-style-type: none"> • Chief SHE Manager • Site SHE Officer • Site SHE Supervisor • Medical Officer (weekly visit, not a full time is required) • Social Welfare Officer 	All positions are as the SHE requirements. Request Declined. Existing clause will prevail
674	56.3(2) (1)	General Instruction: NMRCL/SHE/GI/001 - MINIMUM MANPOWER REQUIREMENTS OF SHE ORGANIZATION BASED ON CONTRACT VALUE	The number of SHE Manpower requirement as mentioned in the contract seems to be incomplete GI:NMRCL/SHE/GI/002, it says about Barricading manager, Housekeeping manager & Labour Welfare Officer, which is missing in GI:NMRCL/SHE/GI/001 As stated in above question, we recommend, following manpower for Telecommunication works <ul style="list-style-type: none"> • Chief SHE Manager • Site SHE Officer • Site SHE Supervisor • Medical Officer (weekly visit, not a full time is required) • Social Welfare Officer 	All positions are as the SHE requirements. Request Declined. Existing clause will prevail

Part 1 Section 2, Bid Data Sheet

1. Replace the existing provision of ITB 1.4 with following

The Telecommunication System including configuration required to be supplied are indicated in the Part III, Section VIII– at the end of General Conditions “Contract Data”

2. Replace the existing provision of ITB 4.8 with following

Further, a Power of Attorney signed by all the Consortium Members duly supported by their board resolutions must also accompany the Bid authorizing the Lead Member, inter alia, to submit the Bid on their behalf. The formats of the Power of Attorney as well as the board resolution are provided in Section IV: Bidding Form (Form 9). As the Contract Agreement will be required to be executed by all other Members of the Consortium also in addition to signing by the Lead Member, therefore each of such other Members is required to issue a Power of Attorney authorizing an individual as its authorized signatory, inter alia, to sign the Contract Agreement. The format of the Power of Attorney is provided in Section IV: Bidding Form (Form 9D).

Power of Attorney given to the authorized signatories by the Managing Director who is empowered to sub delegate the power under board resolution, will also be valid and hold good for the signing and execution of the Bid document

3. Replace the existing provision of ITB 11.1.2 with following

The Bidder shall, on or before the date and time given in the Notice of Invitation to Bid, upload his Bid on e-tendering portal <https://nagpurmetrorail.etenders.in> in accordance with provisions in ITB 22.1.

4. Replace the existing provision of ITB 11.3.1.8 with following

Bidder’s Technical Proposal: The Bidder shall submit with its Bid its Technical Proposals as described in Section IV: Bidding Form (Form 4.4; Annexure IV-C).

The Bidder may be requested by NMRCL in writing to amplify, explain and develop the Contractor’s Technical Proposals in substantially greater detail during the detailed technical package evaluation period such that they may be confirmed as complying clearly with Works Requirements and, in accordance with ITB Para 8.4 herein, can be incorporated into the Contract. Only those aspects of the Contractor’s Technical Proposal that the Employer (at its sole discretion) considers clearly conforming will form part of the Contract.

5. Replace the existing provision of ITB 11.3.1.15 (1) with following

The Bidder shall submit with its Bid, a Works Programme which shall indicate how the Bidder intends to organize and carry out the Works and achieve Stages and complete the whole of the Works by the appropriate Key Dates. Detailed requirements for the Works Programme are set out in Section IV: Bidding Forms (Form 4.3).

Periods for each stage of work are given in Part III, Section IX, PC Part B – Key Dates. The Works Programme shall be prepared in terms of weeks from Commencement Date of Works.

The Works Programme given in the Bid shall not in any event be construed as a submission of the Works Programme as required to be furnished according to the Works Requirements.

6. Replace the existing provision of ITB 11.3.1.19 with following

Declaration for non-engagement of any agent, middlemen or intermediary (as per format provided in Section IV: Bidding Forms (Form 18));

7. Replace the existing provision of ITB 11.3.1.24 (1) with following

All deviations from the Bidding Documents, remarks, comments etc. shall be included in the Statement of Deviations (Section IV: Bidding Forms (Form 4.12)). The price of unqualified and unconditional withdrawal of all the conditions, qualifications, deviations etc. shall be quoted by the Bidder in the format given in Pricing Document (Section IV: Bidding Forms (Annexure 4 of Annexure IV-B) duly indicating the Cost Centre & Milestone to which price shall be allocated. All implicit and explicit deviations, remarks and comments mentioned elsewhere in the Bid shall be treated as NULL and VOID and considered withdrawn unconditionally. Any clause included in the Statement of Deviations but not priced in the Financial Package, shall be treated as NULL and VOID and will be considered unconditionally withdrawn

8. Replace the existing provision of ITB 11.3.1.25 with following

Supporting Technical Documents: The Bidder shall submit with the Technical Package the documents that are identified in paragraphs below. These documents will be used for the purpose of evaluating and analyzing the Bid but will not form part of the Contract, unless the same shall have been expressly incorporated into the Contract.

- a) Details of providers of guarantees and warranties (see ITB 43);
- b) Proposals for use of Site and Site management (see ITB 11.3.1.26 below)
- c) Documents amplifying the Bidder's Technical proposal as described in Section IV: Bidding Forms (Form 4.4; Annexure IV-C)

9. Replace the existing provision of ITB 11.4.1 with following

The Bidder shall submit the following documents duly completed with the Financial Package of its Bid Submission.

- A. Form of Bid (without Appendices)
- B. Completed Pricing Document including the Bid Total Lump sum Price, Taxes and Duties, Bid Total, schedule of amounts apportioned to Cost Centers, monthly cash flows for the Contract Price etc., Unit Prices of Items. The price to be quoted shall be the total price of the Bid as elaborated in Pricing Document (Section IV: Bidding Forms (Form 3; Annexure IV- B), excluding any discounts offered;
- C. Pricing of Unqualified withdrawal of conditions Qualifications, Deviations etc. submitted in 'Statement of Deviation' in Technical Package
- D. The Bidder shall separately quote unconditional discounts, if any, and the methodology (amounts apportioned to Cost Centers) for their application.

10. Replace the existing provision of ITB 11.4.2 with following

Bidders shall quote its price as elaborated in Pricing Document (Section IV: Bidding Forms (Form 3; Annexure IV- B)).

11. Replace the existing provision of ITB 14.2 with following

The Pricing Document is included in Section IV (Bidding Forms (Form 3; Annexure IV- B)). The Bidder shall complete the Pricing Document in accordance with the instructions given therein. The completed Pricing Document shall be submitted with the Letter of Financial Bid.

The Bidder is to note that Key Dates are to be determined by reference to periods from the Commencement Date of the Works. Periods for each stage of Work are given in Section IX. Particular Conditions, Part B – Key Dates'. Milestones Dates shall be, likewise, determined by reference to the respective periods from the Commencement Date of the Works. It is the intention that, prior to Date of Commencement, Key Dates and Milestones will be converted to calendar dates.

Prior to award of Contract, the successful Bidder shall reformat the Pricing Document, Schedule of Milestones, Key Dates / and the Work Programme, so as to correlate between these documents, as required by the Employer.

12. Replace the existing provision of ITB 14.5 with following

Price adjustment is not applicable for the above Contract

13. Replace the existing provision of ITB 14.7 with following

Taxes, duties and fees exemptions, to which payments under the Contract are entitled, are specified in Clause 53 of the Particular Conditions of Contract.

Bidder shall quote its fixed lump sum price inclusive of all taxes, levies, duties, cess, royalty, rates and other charges leviable and payable to the authorities as elaborated in Section IV Bidding Forms (Form 3; Annexure IV- B – Pricing Document). The Bidder shall also give breakdown of its fixed lump sum price clearly giving the Customs Duty, Excise Duty, Value Added Tax (VAT), Works Contract Tax (WCT), Octroi/Entry Tax and other levies/Cess etc.; as elaborated in Section IV Bidding Forms (Form 3; Annexure IV- B – Pricing Document).

Bidders shall quote all prices as per Clause 14.1 of GC and Clause 53 of PC

14. Replace the existing provision of ITB 29.2.1 (new Para) with following

Evaluation of qualifying conditions: Bids that include qualifications which:

1. seek to shift to the Employer, another government agency or another contractor all or part of the risk and/or liability allocated to the Contractor in the Bidding Documents; or
2. which includes a deviation from the Bidding Documents which would render the Works, or any part thereof, unfit for their intended purpose; or
3. Deleted

4. Which fails to commit to the date specified for the completion of the Works as specified under Key Dates 8 under Section IX. Particular Conditions (PC) Part B – Key dates will be deemed non-conforming and shall be rejected.

15. Replace the existing provision of ITB 35.2 & 42.1 with following**ITB 35.2**

In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid price by adjusting the Bid price as follows:

- A. making any corrections for errors pursuant to ITB 31.2;
- B. Making appropriate adjustments for conditions, qualifications, deviations, etc. pursuant to ITB 14.12.
- C. Price adjustment due to discounts offered in accordance with ITB 14.4
- D. Converting the amount resulting from applying (A), (B) and (C) above to a single currency in accordance with ITB 32.1;

ITB 42.1

The Performance Guarantee required in accordance with Clause 4.2 of the GC shall be for an amount as specified in Part III, Section VIII– at the end of General Conditions “Contract Data” in the form of a bank guarantee issued from an Indian Scheduled bank (excluding Cooperative Banks) or from a scheduled Foreign Bank having business office in India as defined in Section 2(e) of RBI Act 1934 read with Second Schedule in the types and proportions of currencies in which the Contract Price is payable.

PART 1, Section-III (EVALUATION AND QUALIFICATION CRITERIA**Annexure III A, PRE-QUALIFICATION (INITIAL FILTER) DOCUMENTS****16. Replace the existing provision of A (FILTER OF APPLICANTS – CHECKLIST), Item No 8 & 11 with following**

8. Is the Net worth of Applicant negative for three years out of last five years?
11. Is the applicant not having the experience of systems & software interface at least 4 subsystems out of FOTS, TETRA, Telephony, CCTV, PAS, PIDS, ACIDS of the Telecom Project in Metro/Airport?

17. Replace the existing provision of B (ASSESSMENT TOPICS), Item No T2 (Profitability) with following

The minimum requirements to ‘Pass’ this criterion is that the Balance sheets should indicate that the Profitability (Earnings or Profit before tax but after interest) shall be positive in at least 3 financial years out of last five financial years.

The financial year as applicable in the country of origin of the bidders would be considered. The ‘last financial year’ will be the latest financial year that ended before the date for bid submission.

In case of a Joint Venture/Consortium, the evaluation against the above eligibility criteria will be done in totality (i.e. algebraic aggregate of evaluation of each member) and not as individual member.

18. Replace the existing provision of B (ASSESSMENT TOPICS), Item No T3 (Management team organization and Project Leader) with following

This will be based upon the Qualification and experience of Project Leader (Project Leader and Management team has been defined in the 'Pro-forma Section 4 of the Initial Filter Questionnaire'). The minimum requirements to 'Pass' this criterion is that the proposed Project Leader should have total experience of minimum 10 years and should have been the Project Head in at least one Project in the last 5 years Metro / Railways/Airport of Telecommunication System.

19. Replace the existing provision of B (ASSESSMENT TOPICS), Item No T4 (Average Annual Turnover) & T5 (Net worth) with following

T4: The minimum Average Annual Turn Over for the last five financial years for Supply, installation, testing and commissioning of Telecommunication systems only (in terms of rupee equivalent adjusted to last date of the financial year by assuming 5% escalation for Indian Rupee and 2% for foreign currency per year shall not be less than INR 1200 Million.

The financial year as applicable in the country of origin of the bidders would be considered. The 'last financial year' will be the latest financial year that ended before the date for bid submission.

In case of a Joint Venture/Consortium, the above evaluation will be done in totality after applying pro-rata percentage participation of each member and not as individual member. For example, if there are three members in a Joint Venture/Consortium with pro-rata percentage participation of 'A%', 'B%' and 'C%' and the Average Annual Turnover of the respective members are 'X', 'Y' and 'Z', then the evaluation for the above criteria will be based on the pro-rata percentage applied algebraic aggregate i.e. 'AX+BY+CZ'.

T5: Net Worth: Net worth of tenderer during last 3 out of 5 financial year should be > **INR 600 Million**. In case of joint venture /Consortium, Net worth will be based on the Combined net worth of each Member.

Example: Let the Net worth of Member-1 is A and that of Member-2 is B, then the Net worth of JV will be =A+B

20. Replace the existing provision of B (ASSESSMENT TOPICS), Item No T6 with following

a. Eligible Applicants :

- i. The bid for this work will be considered only from those bidders (proprietorship firms, partnerships firms, companies, corporations, consortia or joint ventures) who meet requisite eligibility criteria prescribed in Clause T6 Qualification Criteria in this

document. In the case of a JV or Consortium, all members of the Group shall be jointly and severally liable for the performance of whole contract.

- ii. A Bidder may be from any country either as a single entity or any combination of entities in the form of a Joint Venture (JV) or Consortium under an existing agreement. In the case of a JV / Consortium, all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms and the JV or Consortium shall nominate a representative who shall have the authority to conduct all business for and on behalf of any and all the partners of the JV / Consortium during the tendering process and, in the event the JV or consortium is awarded the Contract, during contract execution.
- iii. In case of JV / Consortium, a statement of participation for each constituent member shall be submitted to the effect that they are bona fide members of the group applying for the tender and that, in the event of award of works, they agree to be jointly and severally liable to NMRCL. Details of the existing or proposed joint venture, partnership or consortium agreement in the form of a Memorandum of Understanding (MOU) signed by all participants shall be submitted. International contractors who are considering forming joint ventures, partnerships or consortia for the purpose of applying for the bid, are encouraged to involve suitable local partners.
- iv. A Bidder and all partners constituting the Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:
 - a) A Bidder and any partner constituting the Bidder has been engaged by the Employer to provide consulting services for the preparation related to procurement for or implementation of the project;
 - b) A Bidder and any partners constituting the Bidder is any associates/affiliates (inclusive of parent firms) mentioned in subparagraph (a) above; or
 - c) A Bidder and any partner constituting the Bidder lends, or temporarily seconds its personnel to firms or organizations which are engaged in consulting services for the preparation related to procurement for or implementation of the project, if the personnel would be involved in any capacity on the same project.
- v. A Bidder shall submit only one bid in the same bidding process, either individually as a Bidder or as a partner of a JV or consortium. A Bidder who submits or participates in, more than one bid will cause all of the proposals in which the Bidder has participated to be disqualified. No Applicant can be a subcontractor while applying for the bid individually or as a partner of a JV/Consortium in the same bidding process. A subcontractor in any bid may participate in more than one bid, but only in that capacity.
- vi. A firm, who has purchased the bid document in their name, can submit the bid either as individual firm or in Joint Venture (JV) or consortium.
- vii. Any Central / State Government department, Public Sector Undertaking or Metro Corporation or other Govt. entities or local body must not have banned business with the bidder (any member in case of JV or consortium) and being subject to an exclusion decision of the World Bank, and being listed on the website

<http://www.worldbank.org/debarr> as on the date of bid submission. Also no work of the bidder must have been rescinded / terminated by any Metro Corporation after award of contract during last 5 years due to non- performance of the bidder. The bidder should submit undertaking to this effect in Annexure-6 of Initial Filter Questionnaire.

viii. Lead partner / Non-substantial partner / Change in JV / Consortium

- a) Lead partner must have a minimum of 40% participation in the JV / Consortium.
- b) Each Partner shall have minimum 26% participation. Partners having less than 26% participation will be termed as non-substantial partner and will not be considered for evaluation.
- c) All members combined shall meet 100% requirement.
- d) In case of JV / Consortium, change in constitution or percentage participation shall not be permitted at any stage after their submission of application otherwise the applicant shall be treated as non-responsive. Lead partner shall be one of the substantial partners based on whose strength work experience is accounted for in meeting the criteria of Clause T6 (b).

ix. JV/Consortium: Consequences for deviation from JV/MOU

The bidder, in case of JV/Consortium, shall clearly and unambiguously define the role and responsibilities for each substantial/non-substantial partner in the JV/ MOU submitted vide 4.10 Section IV – Bidding Forms, providing clearly that any abrogation/subsequent re-assignment of any responsibility by any substantive/non-substantive partner of JV/Consortium in favour of other JV/Consortium partner (without written approval of Employer) or any change in constitution of partners of JV/Consortium from the one given in JV/MOU at tender stage, will be treated, as ‘breach of contract condition’ and/or ‘misrepresentation of facts’ (as the case may be), vide Clause 15 and acted accordingly.

The Employer in such cases, may in its sole discretion rescind the contract under and/or take appropriate action against any member(s) under clause 15 GCC for failure in tender obligation to declare a contractor ineligible for award of any tender in NMRCL or take action to terminate the contract in part or whole under clause 15 of GCC as the situation may demand and recover the cost/damages as provided in contract besides forfeiting the performance and other guaranties.

- x. A Bidder and all partners constituting the Bidder shall confirm non-performance of a contract did not occur within the last two (2) years prior to the deadline for application submission based on all information on fully settled disputes or litigation. A fully settled dispute or litigation is one that has been resolved in accordance with the Dispute Resolution Mechanism under the respective contract and where all appeal instances available to the Applicant have been exhausted. The bidder shall submit Annexure-7 of Initial Filter Questionnaire in this regard.

(b) Minimum Eligibility Criteria

(i) a (Work Experience Requirements for Telecommunication Systems)

The applicant (or the concerned member of JV/Consortium) should have successfully carried out the following work(s) in the last 10 (TEN) years as given below. If the work was done in another JV / Consortium, the value in proportion of participation in that JV / Consortium by the member only will be considered.

- (i) At least one Telecommunication Work **costing not less than INR 1540 Million.**
OR
 At least two Telecommunication Work each costing **not less than INR 960 Million.**
OR
 At least three Telecommunication Work each costing **not less than INR 770 Million**

Note: If a Bidder is foreign entity/partner, he must have done at least one Telecommunication Work costing **not less than INR 960 Million**, outside the country of origin.

- (ii) in the above Telecommunication work under clause T6 b(i), Applicant must have experience of Commissioning & interfacing of at least 4 subsystems out of FOTS, TETRA, Telephony, CCTV, PAS, PIDS, ACIDS, of telecom sub-systems in Metro or Airport.

Notes:

- i. Deleted.
- ii. The bidder shall mention the name of the projects to be used for each of **Clause T6 (b) i (a)** along with documentary evidence in the form of client certificate(s).
- iii. The bidder shall submit details of work executed by them in the Performa of **Annexure-1 and Annexure 1A of Initial Filter Questionnaire** for the works to be considered for qualification of work experience criteria. Documentary proof such as completion certificates from client clearly indicating the nature/scope of work, actual completion cost and actual date of completion for such work should be submitted.

Supporting documents related to Work Experience, Financial & Technical eligibility criteria enclosed with the bid, other than English language should accompany a translated copy by a certified translator in English and will have to be endorsed/attested by Indian embassy or any authorized / recognized agency of India Embassy, where the supporting documents is being issued. The contact address & identification of certified translator must be mentioned at the end of the translated copy of the document.

However, such documents provide by bidders from a country which has signed Hague legislation convention 1961 is not required to be endorse by Indian embassy. If it carries confirming Apostille certificate.

The bidder should provide the relevant contact number and E-mail ID, Contact No. along with the postal address in English, of issue authority/agency of such documents for verification purpose.

In case the work is executed for private client, copy of work order, bill of quantities, bill wise details of payment received certified by C.A., T.D.S certificates for all payments received and copy of final/last bill paid by client shall also be submitted.

- iv. Value of successfully completed portion (taken over by the client and operational, even if partial) of any on-going work up to 28 days before the date of Bid submission will also be considered for qualification of work experience criteria.
- v. For completed works, value of work done shall be updated by assuming 5% inflation for Indian Rupees every year and 2% for foreign currency portions per year. **The exchange rate of foreign currency shall be applicable 28 days before the submission date of bid.**
- vi. In case of joint venture / Consortium, full value of the work, if done by the same joint venture shall be considered. However, if the qualifying work(s) were done by them in JV/Consortium having different constituents, then the value of work as per their percentage participation in such JV/Consortium shall be considered.
- vii. Ten (10) year/last 10 years means the period of last ten (10) years counted from the twenty-eight (28) days prior to bid submission. e.g if date for bid submission is 10.10.16, then twenty-eight days prior to bid submission will be 11th Sept 2016

In case of postponement(s) in 'date of bid submission', if any last ten (10) year means twenty-eight (28) days prior to postponed date for bid submission.

- viii. Indian subsidiary of parent Company may quote on the strength of eligibility of Parent Company, provided they submit a Guarantee from Parent Company as per format enclosed under Form 24

21. Replace the existing provision of C (BID CAPACITY EVALUATION), A with following

Maximum of the value of Telecommunication works executed in any one year during the last five financial years (updated to last date of the financial year by assuming 5% escalation for Indian Rupee and 2% for foreign currency every year)

The financial year as applicable in the country of origin of the bidders would be considered. The 'last financial year' will be the latest financial year that ended before the date for bid submission

PART 1, Annexure III A, INITIAL FILTER DOCUMENTS, INITIAL FILTER QUESTIONNAIRE

22. Replace the existing provision of (CONTENTS OF EACH SECTION), Section 1 with following

Section Number	Contents of each Section	Remarks
1	<u>Pro-forma – General</u> Letter of Application & Letter of Participation from each Member of Group	
	Completed Initial Filter Questionnaire	

23. Replace the existing provision of (PRO-FORMA LETTER OF APPLICATION) with following

PRO-FORMA LETTER OF APPLICATION (on Firm's Letterhead)

**Managing Director
Nagpur Metro Rail Corporation Limited
Metro House, Bungalow No: 28/2,
Anand Nagar, CK Naidu Road, Civil Lines,
Nagpur-440001, Maharashtra, INDIA**

(Applicant to provide date and reference)

APPLICATION FOR INITIAL FILTER TENDER NUMBER N1TL-01/2016

Dear Sir,

We hereby make application for Initial Filter as a tenderer of the DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF TELECOMMUNICATION SYSTEM. In support of the application we submit herewith the required documents.

(In the case of other than a sole proprietorship firm add the following paragraph)

A Power of Attorney to sign and submit this letter is attached
(In the case of a joint venture/consortium add the following paragraph)

This application is submitted on behalf of a joint venture/consortium (applicant to delete as appropriate) comprising (applicant to state the names of each member) and of which (applicant to insert name of leading member of joint venture/consortium) has agreed to act as leader. Each member has prepared a statement of participation in relation to this application and these are contained in [Section 2](#) herewith.

24. Replace the existing provision of (PRO-FORMA SECTION 3), item No 17a with following

Performance Record: Applicants should scrutinize the contract description contained in this Initial Filter Brochure and compile a list showing their previous experience of similar contracts completed during the last ten (10) years. The applicant must demonstrate experience in all areas covered by this contract including design, supply, installation and commissioning of Telecom systems of sizes and technology comparable to those contemplated under this contract. Ability to provide these systems in a short time period on schedule must be demonstrated Further information and literature associated with performance and reliability, together with technology transfer achieved on previous contracts, experience in supervision of maintenance and relevant experience of the applicant and each constituent member and clearly referenced shall be enclosed in [Section 3](#). All material should be clearly referenced as being in response to this [Question 17a](#).

- Do you (and each constituent member of the group) authorize NMRCL to make enquiries with any of the Clients listed by the Applicant?
[Y] / [N]
- Have you (and each constituent member of the group) provided details required in [Annexure 1 and 1A](#) for similar Contracts undertaken in the last ten (10) years?
[Y] / [N]

(Use a separate sheet for each Contract and include in the Questionnaire)

25. Replace the existing provision of (PRO-FORMA SECTION 3), item No 17c with following

Annual financial turnover from Telecommunication System only as on 'last date of the financial year that ended before the date of issue of NIT for this tender' for the last 5 financial years (in terms of rupee equivalent adjusted to 'last date of the financial year that ended before the date of issue of NIT for this tender' by assuming 5% escalation for Indian Rupee and 2% for foreign currency per year, along with audited copy certified by an Independent Chartered Accountant / CPA for Annual financial turnover of last 5 financial years for Telecommunication System only.

Financial year	Annual Financial Turnover				
	Contract Details			SBI Bill selling exchange rate as on 'last date of the financial year that ended before the date of issue of NIT for this Bid	Rupee equivalent as on 'last date of the financial year that ended before the date of issue of NIT for this Bid
	Currency	Value	Escalated as on 'last date of the financial year that ended before the date of issue of NIT for this Bid		
5 th last financial year i.e. from to					
4 th last financial year i.e. from to					
3 rd last financial year i.e. from to					
2 nd last financial year i.e. from to					
Last financial year i.e. from to					

Note: The financial year as applicable in the country of origin of the bidders would be considered. The 'last financial year' will be the latest financial year that ended before the date for bid submission.

26. Replace the existing provision of (PRO-FORMA SECTION 3), Annexure 1 with following

ANNEXURE 1

Name of the Applicant / Member (in case of JV/consortium)

Note: Separate proforma shall be submitted for each work.

Project	Title:	Location:
Brief scope of work	
Client:.....	Client address:.....	
Client Representative:.....	Tel no. / email:.....	
Type of contract (ICB / Others): Please <input type="checkbox"/> whichever is applicable		
Telecommunication Systems / Integration		
Others (please specify)		
Whether at least one Telecommunication Work costing not less than 1540 Million. OR At least two Telecommunication Work each costing not less than INR 960 Million. OR At least three Telecommunication Work each costing not less than INR 770 Million Note: If a Bidder is foreign entity/partner, at least one Telecommunication Work costing not less than INR 960 Million , outside the country of origin. [Y] / [N]		
Whether the Telecommunication work experience includes Commissioning & interfacing of at least 4 subsystems out of FOTS, TETRA, Telephony, CCTV, PAS, PIDS, ACIDS, of telecom sub-systems. [Y] / [N]		
Was an Indian Government standard form of contract used? If yes Give details [Y] / [N]		
Was an international standard form of contract used? If yes Give details [Y] / [N]		
Was the work carried alone or as a member of the group? If a group, indicate percentage participation and area/s of participation [Y] / [N]		

Date work commenced	Date work was completed
<p>Was the date of completion given in the original contract extended? If so by how much and why? [Y] / [N]</p>	
<p>Was any penalties imposed for delay? If Yes give details [Y] / [N]</p>	<p>Did the applicant go in for Arbitration? If Yes give details [Y] / [N]</p>
<p>Were any penalties imposed for reasons other than delay? If yes give details [Y] / [N]</p>	<p>Did the applicant go in for Litigation If Yes give details [Y] / [N]</p>
<p>Were Quality Assurance obligations required in the contract? If yes, whether they were fulfilled? [Y] / [N]</p>	
<p>Were specified performance requirements of the systems achieved? [Y] / [N]</p> <p>If yes, please give details of reliability in terms of availability of the systems achieved during warranty period or three years from the date of commissioning whichever is later</p> <p>If No, give reasons.....</p> <p>Has the applicant (or any member of a group) been blacklisted by a client? [Y] / [N] If yes why?</p>	
<p>Was there any complaint received from the client relating to the performance of the System? [Y] / [N] If yes give details</p>	
<p>Did the arrangements / facilities exist to rectify defects during warranty period? [Y] / [N] If yes give details</p>	
<p>Was technology transferring a part of the contract? [Y] / [N] Was the technology transfer achieved as contracted? [Y] / [N] If yes what was the time frame?</p>	
<p>Project description including transfer of technology for system assembly, installation, maintenance and software customization / modification details. Briefly indicate plan of action in the direction of progressive technology transfer to India.</p>	

Note: Any wrong information given by the Applicant will lead to disqualification of the Applicant.

27. Replace the existing provision of (PRO-FORMA SECTION 3), Annexure 2 with following

ANNEXURE 2 Works in Hand: As on first day of the month of tender submission

Name and particulars of contract (Clearly indicate the part of the work assigned to the applicant (s))	Name of client with telephone number and fax number	Contract Value In Rupees Equivalent (Give only the value of work assigned to the applicant(s) (Assume inflation as given in Annexure 1)	Value of balance work yet to be done in Rupee equivalent as on 28 days prior to Bid submission	Date of Completion as per Contract Agreement	Expected Completion Date	Delay, if any, with reason	Value of work to be done from 01.06.16 to 31.03.17	Value of work to be done in 01.04.17 to 31.03.18	Value of work to be done in 01.04.18 to 31.03.19

This information should be for all the works in progress including those listed in [Annexure 2](#) (to be certified by an independent Chartered Accountant/ CPA).

28. PRO-FORMA SECTION 5, Annexure 5 Replace the “Actuals for previous five years ending on or before 31.12.2015” with “Actuals for previous five years ending on or before 28 days prior to Bid submission date”

29. PRO-FORMA SECTION 6, Annexure 7. Replace the “Contract non-performance did not occur during the last two years specified in Clause-T6 a (xi) of Annexure III-A: Pre-Qualification (Initial Filter) Documents

With “Contract non-performance did not occur during the last two years specified in Clause-T6 a (x) of Annexure III-A: Pre-Qualification (Initial Filter) Documents

PART 1, SECTION IV: BIDDING FORMS

3 Schedule ANNEXURE IV-A: INSTRUCTIONS FOR COMPLETING THE PRICING DOCUMENT

30. Replace the provision of , Annexure IV A with following

Modified annexure IV (B) Pricing document enclosed as annexure 1 to Corrigendum/addendum

3 Schedule, Annexure IV B PRICING DOCUMENT

31. Replace the provision of , Annexure IV B with following

Modified annexure IV (B) Pricing document enclosed as annexure 2 to Corrigendum/addendum

32. Replace the existing provision of 4.3 (Works Programme and Design Submission Programme) PARA 13 with following

The Bidder's attention is drawn to the Key dates specified in Part III, Section IX. Particular Conditions Part B – Key Dates. The Bidder shall prepare logic diagrams providing the philosophy for interface with other designated contractors & availability of track, electrification and signaling system to be available and submitted as part of its Bid. These logic diagrams shall be developed and submitted along with the Works Programmes as submitted during the course of the Works.

Clause 4.4 (Annexure IV, C Technical Proposal)

33. Para 4.2 3rd para replace “(Section IV: Bidding Forms (Form 4.12)) and shall be priced in Annexure-4 of Pricing Document (Part 1B).” with “(Section IV: Bidding Forms (Form 4.12)) and shall be priced in Annexure-IV B Pricing Document”

34. Replace the existing provision of para 4.3 with following

Bidder shall also note that:

Any comment by the Bidder in the Clause-by-Clause Commentary, other than either of “Complied”, “Noted” or “Not Complied” shall be treated as “Not Complied”. Unless Bidder prices against such clauses in the [Annexure-IV B Pricing Document](#) , the comment shall be considered as unconditionally withdrawn with no financial implications and shall be considered as NULL and VOID.

Any “Not Complied” comment by the Bidder in the Clause-by-Clause Commentary which has not been included in the Statement of Deviations ([Section IV: Bidding Forms \(Form 4.12\)](#)) shall be treated as “Complied” with no financial implications.

Any “Not Complied” comment by the Bidder in the Clause By Clause Commentary, which has also been included in the Statement of Deviations ([Section IV: Bidding Forms \(Form 4.12\)](#)) but has not been priced in [Annexure-IV B Pricing Document](#) shall be treated as null and void and deemed to have been unconditionally withdrawn with no financial implications.

In case price for unqualified withdrawal of any remark, comment, condition, qualification or deviation etc. indicated in [Statement of Deviations \('A', 'B' and 'C'\)](#) ([Section IV: Bidding Forms \(Form 4.12\)](#)) is not quoted in [Annexure-IV B Pricing Document](#), it shall be considered that the remark, comment, condition, qualification or deviation is unconditionally withdrawn without any financial implication. However, Employer at its sole discretion and option may assess the financial implication of the said remark, comment, condition, qualification or deviation etc. based on best engineering principles and concepts, which shall be binding on the Bidder, and the same may be considered by Employer for financial evaluation.

35. Replace the existing provision of para 4.4 A.1 with following

The Tenderer shall submit a detailed clause-by-clause commentary on all the clauses of the Employer’s Requirements. Where a clause merely provides information, and no other comment is necessary, “Noted” will suffice. Where the Tenderer is not able to comply fully with certain clauses and proposes an alternative design, the deviations shall be consolidated and listed separately in the Statement of Deviations. Excepting the items listed in the statement of deviations, the contractor shall give a Certificate of Compliance in the form attached of all the items

36. Replace the existing provision of para 4.4 A.9 with following

The Tenderer shall submit the details of proposed systems with specific reference to the parameters, such as Reliability, Availability, Maintainability, Safety, Service-Capacity, Recoverability, Electro-magnetic Compatibility as stipulated in Employer’s Requirement.

The Tenderer shall also submit the existing/ proposed maintenance facilities in India for subsystems/ items

37. Replace the existing provision of para 4.4 A.10 with following

For each system/sub-system the Tenderer shall submit:

- a) Details of project staff
- b) Technical Information of equipment proposed by the Tenderer. The Tenderer shall also submit a summary
- c) Information for justifying the proven-ness of the equipment proposed by the Tenderer
- d) Information for In-house or the sub-contract of design and manufacture or vending proposed by the Tenderer Proposed Supplier, Country(s) and technology adopted.
- e) Proposed design criteria.
- f) Proposed method for demonstrating as to how the functional, performance and safety requirements are to be met.
- g) Type test results performed on the equipment.
- h) Details of proposed methods for performance evaluation under test conditions and in field conditions.

- i) Conformity to the required International, CENELEC, Indian Railway and other standards, as stipulated in the Employer's Requirements.
- j) Electromagnetic compatibility of all sub-systems/systems in accordance with the standards stipulated in the Employer's Requirements.
- k) Physical dimensions, space requirements.
- l) Power supply requirements.
- m) Information for equipment/ sub-systems to be manufactured /procured subcontracted in India proposed by the Tenderer

38. Replace the existing provision of Note 4 of 4.12 (A), (B) & (C) (STATEMENT OF DEVIATIONS) with following

We hereby confirm that all implicit and explicit deviations, comments and remarks mentioned in this 'Form 4.12 Statement of Deviations' but are not priced in Annexure-4 of Annexure IV-B Pricing Document for its unqualified withdrawal, shall be treated as NULL and VOID and stand withdrawn.

39. Replace the existing provision of SN 4 of 4.12 (D) (STATEMENT OF DEVIATIONS) with following

We hereby confirm that all implicit and explicit deviations, comments and remarks mentioned in 'Form 4.12 Statement of Deviations' but are not priced in Annexure-4 of Pricing Document (Annexure IV B) for its unqualified withdrawal, shall be treated as NULL and VOID and stand withdrawn.

40. Replace the existing provision of 10 (Bid Index) with following

The Bidder shall include with its Bid an index which cross refers all of the Employer's bidding requirements elaborated in these documents to all the individual sections within Package 1: Technical Package and Package 2: Financial Package which the Bidder intends to be the responses to each and every one of those requirements.

The Packages submitted must be clearly presented, all pages numbered and laid out in a logical sequence with main and subheadings to facilitate evaluation.

Indicative list & format for Bid Index for Package 1: Technical Package and Package 2: Financial Package

Index of Offer

SN	Form No.	Details	Page No		Remark
			From	To	
A		Technical Proposal			
1	10	Bid Index			
2	1	Letter of bid			
3	6	Bid Security			
4	5	Bidders Qualification without Prequalification			
5		Filter of Applicants Checklist			

SN	Form No.	Details	Page No		Remark
			From	To	
6		Average Annual Turnover of last 5 years duly certified by CA			As per requirement in Annexure III A
7		Bidder's Work Experience			As per requirement in Annexure III A Initial filter
8		Pre-qualification (Initial Filter) Questionnaire complete and duly filled including Verification Statement.			Each verification statement enclosed needs to be listed separately
9	14	Undertaking for Downloaded Bidding Documents			
10	15	Banking Reference for Liquidity			
11		Bid capacity duly certified by CA			
12		Copy of CA certificate (Financial performance) Proof of profit making during any two of last financial years			
13	16	Certificate conforming Submission of all Documents of Financial Package in Technical Package with Price left blank			
14	19	Certificate of careful examination of all the contents of bidding document and signing of all pages of bidder's Proposal			
15	1A	Letter of Participation from each Partner of Joint Venture			
16	8	Joint Bidding Agreement			
17		Details of previous collaborations between consortium / JV members in any other project.			
18		Undertaking regarding Non Performance during last 5 years (Annexure 6)			
19	9A	Board Resolution(Bidder)			Not applicable in case of Consortium
20	9B	Board Resolution(Lead member)			Applicable in case of Consortium
21	9C	Board Resolution(Other Than Lead member)			Applicable in case of Consortium
22	9D	Power of Attorney			By Each Member except Lead Member in

SN	Form No.	Details	Page No		Remark
			From	To	
					favour of Lead Member
23	9E	Power of Attorney			Lead Member
24	9F	Power of Attorney			By Each member
25		PAN Details			Indian Bidder
26	4.1	Staffing schedule & Organization chart			
27	4.2	Method statement			
28	4.3	Work Programme & Design Submission Programme			
29	4.4	Bidder's technical Submissions			
30	4.5	Form EQU: Equipments			
31	4.6	Personnel			
32	4.7	Outline Quality Plan			
33	4.8	Outline Safety Assurance Plan			
34	4.9	Outline Safety, Health and Environmental Plan			
35	4.10.	Outline Project Management Plan			
36	4.11	Structure of the Bidder			
37	4.12A	Statement of Deviations (ITB, BDS & Bidding Forms)			
38	4.12B	Statement of Deviations (GCC & PCC)			
39	4.12C	Statement of Deviations (Work Requirement)			
40	4.12D	Undertaking For Pricing for Deviations withdrawal			
41		Clause by clause commentary			
42	13	Undertaking Regarding Confidentiality of Bid Information			
43	17	Certificate conforming Submission of all Bidding Documents & Addenda			
44	18	Declaration of Non-engagement of any agent, Middleman or intermediary			
45	20	Undertaking for ensuring supply of critical spares and availability of technical support			
46	21	Undertaking for passing on benefits of exemptions to NMRCL and for adjustment of amounts due from balance due			
47	22	Undertaking for obtaining registrations under various fiscal and labour laws			
48	2.2	Statement of integrity, Eligibility, and social and Environmental Responsibility			
49		Proposals for use of Site and Site management			

SN	Form No.	Details	Page No		Remark
			From	To	
50		Manufacture, Installation, Testing and Commissioning Methods			
51		Bidder's Proposed Works and Design submission Programme			
52		Design Submission Programme to cover the Design Phase.			
53		Any further documents which are requested in writing by Employer before submission of the Bid by way of evaluation documents but which are not to form part of the Contract.			
54		Any other document to comply the Bid Document			
B		Financial Proposal			
1		Form of Bid (without Appendices)			As per Annexure IV A & B
2		Completed Pricing Document			ITB 11.4.
3		Pricing of Unqualified withdrawal of conditions Qualifications, Deviations etc. submitted in 'Statement of Deviation' in Technical Package			ITB 11.4.
4		The Bidder shall separately quote unconditional discounts, if any, and the methodology (amounts apportioned to Cost Centers) for their application			ITB 11.4.

It may be noted that list is indicative & bidder Needs to ascertain that all the required information is submitted.

41. Replace the existing provision of 12 (Methodology for Working Out the Monthly Cash Flows), Item No 8 with following

Amount of Advance Payment: 20% (interest free) of the total Contract Price in the respective currencies in two installments as detailed in PC. The Contract Price shall be Bidders' offered price in Financial Package including prices of unconditional withdrawal of Deviations.

42. Replace the existing provision of 12 (Methodology for Working Out the Monthly Cash Flows), Item No 10 with following

Mobilization Advance: Advance is paid in two tranches – first and second tranche are 10% and 10% respectively of total Contract Price in respective currencies.

Recovery shall start once 20% of Contract Price in respective currencies is paid. Amount recovered shall be 25% of the Interim Payments in respective currencies paid in these respective currencies is recovered.

43. Replace the existing provision of 12 (Methodology for Working Out the Monthly Cash Flows), Item No 12 with following**PRICE OF WITHDRAWAL**

To be added to Milestones as quoted by the Bidder in [Annexure-4 of Annexure IV-B Pricing Document](#)). In case the cost center & milestone no. is not specified by the Bidder, this amount to be considered with the last milestone under Cost Centre 'D'.

The FC to be rounded off to Zero decimal places and the LC rounded off to Rupee as per [PC 56](#).

In case, the aggregate distributed amount is not equal to the Price of withdrawal of the condition, adjustment to be done in the earliest Milestone to which the price has been distributed.

44. Add additional Form No 23 & 24

Manufacturers Authorization Form & Parent Company Undertaking

Manufacturer's Authorization

[The Bidder shall require the Manufacturer to fill in this Form in accordance with the instructions indicated. This letter of authorization should be signed by a person with the proper authority to sign documents that are binding on the Manufacturer. The Bidder shall include it in its bi]

Date: [insert date (as day, month and year) of Bid Submission]

ICB No.: [insert number of bidding process]

To: [insert complete name of Purchaser]

WHEREAS

We [insert complete name of Manufacturer], who are official manufacturers of [insert type of goods manufactured], having factories at [insert full address of Manufacturer's factories], do hereby authorize [insert complete name of Bidder] to submit a bid the purpose of which is to provide the following goods, manufactured by us [insert name and or brief description of the goods], and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Conditions of Contract, with respect to the goods offered by the above firm.

Signed: [insert signature of person whose name and capacity are shown above]

Name: [insert complete name of person signing the Bid]

In the capacity of [insert legal capacity of person signing the bid]

Duly authorized to sign this Authorization on behalf of:
Dated on _____ day of _____, _____ [insert date of signing]

Note: This letter of authorization should be on the letterhead of the Manufacturer and should be signed by a person with the proper authority to sign documents that are binding on the Manufacturer.

**Form 24
Parent Company Guarantee**

THIS GUARANTEE is made the _____ day of _____

BY _____ whose registered office is at _____ [and _____ whose registered office is at _____] ("the Guarantor").

To Nagpur Metro Rail Corporation Limited together with its successors and assigns, "the Employer") of:

.....

WHEREAS

(A) By a Contract for _____ of Nagpur Metro Rail Project Contract No: N1TL-01/2016 ("the Contract") made between

(1) Nagpur Metro Rail Corporation Limited (the "Employer")

and

(2) _____ (the "Contractor") the Contractor has agreed to design, execute, complete and remedy any defects in the works ("the Works") upon the terms and conditions contained in the Contract.

(B) Pursuant to the terms of the Contract, the Contractor has agreed to procure the provision of a guarantee in the terms hereof. [see Note 1]

(C) At the request of the Contractor, the Guarantor has agreed to guarantee performance of the Contract by the [Contractor] [see Note 2] as set out herein.

IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the Employer entering into the Contract with the Contractor, the Guarantor irrevocably and unconditionally guarantees to the Employer as a primary obligation and not as a surety due performance by the [Contractor] [see Note 2] of all of its obligations and liabilities under and in accordance with the Contract save that nothing herein shall be construed as imposing greater obligations or liabilities on the Guarantor than are imposed on the [Contractor] [see Note 2] in the Contract.

2. The obligations of the Guarantor under this Guarantee shall remain in full force and effect and shall not be affected or discharged in any way by and the Guarantor hereby waives notice of:
 - a. any suspension of the Works, variation to or amendment of the Contract (including without limitation extension of time for performance) or any concession or waiver by the Employer in respect of the Contractor's obligations [and/or the obligations of _____] [see Note 3] under the Contract;
 - b. any provision of the Contract being or becoming illegal, invalid, void, voidable or unenforceable;
 - c. the termination of the Contract or of the engagement of the Contractor [and / or _____] [see Note 3] under the Contract for any reason;
 - d. any forbearance or waiver of any right of action or remedy the Employer may have against the Contractor [and / or _____] [see Note 3] or negligence by the Employer in enforcing any such right of action or remedy;
 - e. any bond, undertaking, security or other guarantee held or obtained by the Employer for any of the obligations of the Contractor [and / or _____] [see Note 3] under the Contract or any release or waiver thereof.
3. This Guarantee shall extend to any variation of or amendment to the Contract and to any agreement supplemental thereto agreed between the Employer and the Contractor [and/or _____] [see Note 3] and for the avoidance of doubt the Guarantor hereby authorises the Employer and the Contractor [and/or _____] [see Note 3] to make any such amendment, variation or supplemental agreement.
4. This Guarantee is a continuing guarantee and accordingly shall cover all of the obligations and liabilities of the [Contractor] [see Note 2] under the Contract and remain in full force and effect until all the said obligations and liabilities of the Contractor shall have been carried out, completed and discharged in accordance with the Contract. This Guarantee is in addition to any other security which the Employer may at any time hold and may be enforced without first having recourse to any such security or taking any steps or proceedings against the Contractor.
5. Until expiry of the Defects Liability Period (as defined in the Contract) for the whole and every part of the Works, the Guarantor shall not on any ground whatsoever make any claim or threaten to make any claim whether by proceedings or otherwise against the Contractor [and/or _____] [see Note 3] for the recovery of any sum paid by the Guarantor pursuant to this Guarantee. Any such claim shall be subordinate to any claims (contingent or otherwise) which the Employer may have against the Contractor [and/or _____] [see Note 3] arising out of or in connection with the Contract until such time as such claims shall be satisfied by the Contractor [and/or _____] [see Note 3] or the Guarantor as the case may be. To that intent the Guarantor shall not claim or have the benefit of any security which the Employer holds or may hold for any monies or liabilities due or incurred by the Contractor [and/or _____] [see Note 3] to the Employer and, in case the Guarantor receives any sum from the Contractor [and/or _____] [see Note 3] in respect of any payment by the Guarantor hereunder, the Guarantor shall hold such sum in trust for the

Employer for so long as any sum is payable (contingently or otherwise) under this Guarantee.

6. The Employer shall be entitled to assign the benefit of this Guarantee at any time without the consent of the Guarantor or the [Contractor] [see Note 2] being required.
7. All documents arising out of or in connection with this Guarantee shall be served:
 - a. upon the Employer, at _____ marked for the attention of _____;
 - b. upon the Guarantor, at _____ India [see Note 5]
8. The Employer and the Guarantor may change their respective nominated addresses for service of documents to another address but only by prior written notice to each other. All demands and notices must be in writing.
9. This Guarantee shall be governed by and construed according to the laws for the time being in force in India and the Guarantor agrees to submit to the exclusive jurisdiction of the courts at Nagpur, Maharashtra, India.

IN WITNESS whereof this Guarantee has been executed as a deed on the date first before written

.....

Name:

Designation:

Date of Board resolution authorizing executant to execute this undertaking

Place:

Notes:

(For preparation of but not inclusion in the engrossment of this Guarantee)

1. If the Contractor is a Consortium, that fact and the Consortium or other relevant agreement and the relationship of the Guarantor to the concerned Members forming part of the Contractor must be recited.
2. If Note 1 applies, replace the word "Contractor" with name of the concerned Member of the Consortium being guaranteed.
3. If Note 1 applies, add additional wording and insert the name the concerned Member of the Consortium being guaranteed.
4. The notarized copy of the board resolution of the Guarantor must also accompany this Guarantee. In case the Guarantor is a foreign entity, then such board resolution should be notarized by a notary in its home country followed by the consularisation by the Indian Embassy there, or apostilised as per Hague Convention, as the case may be.
5. The address for service shall be in India.

**PART II: WORKS REQUIREMENTS, SECTION VII-A EMPLOYERS
REQUIREMENT GENERAL SPECIFICATION****45. Add the following provision in 1.14**

The Contractor shall demonstrate full compliance with the Contract requirements relating to the Reliability, Availability, Maintainability and Safety at all stages of the contract implementation.

The requirements relating to Maintainability and Safety shall be demonstrated before the commencement of Trial Running and may begin as soon as the necessary systems or elements of systems have been tested and commissioned.

It is unlikely that the requirements relating to Reliability and Availability can be fully demonstrated before the commencement of Trial Running and these shall therefore be fully demonstrated throughout Trial Running Period and the Defects Liability Period.

In conjunction with approved System Safety Plan, the Contractor shall develop demonstration plans and submit for the Employer's Representative's review.

Equipment, outlets, containment, mechanical fixtures shall be constructed of durable materials with aesthetic finishes and sealing ratings appropriate to their location and exposure to dust, moisture and other contaminants

46. Add the following provision in new para 8.7

N1TL01 shall insure provision of all necessary secondary cable containment, trays, conduits etc.

- a) Design, supply and installation of cables and spur cable containments incl. conduits (surface/embedded) from the primary containment provided by the other contractors for all field and indoor equipment devices. This shall be including Power & data cable as also Communication cables required for functioning/energization of all end / field devices.
- b) All power cables in primary containment shall be armored and other outdoor cable shall be armored & shielded and indoor cable shall be shielded. All indoor cables including connection to end-devices will be routed in conduits with proper saddles with no exposed cables.
- c) All connection to endpoints should be through termination boxes / points (IP 54 as minimum for indoor, IP 66 for outdoor) which would be properly mounted on the nearest available structure location.
- d) Conduits embedded inside the wall shall be PVC LSZH .
- e) Conduits to be embedded under floor shall be GI make of 25 mm diameter.
- f) Only one circuit shall be allowed from single conduit.
- g) Cables shall be suitable for installation and continuous operation when exposed (outdoor) to the environment within which they will be installed.
- h) Care shall be taken that interference susceptible signal lines are not affected by high current carrying lines.
- i) Cable flexible shall be either of GI or UV protected PVC type.
- j) Cable to be dressed and tied with UV protected ties.

- k) In addition cable shall be labeled at Entry / Exit point to the building room, at least one point on the tray work between source & destination of the cable and at not more than 25 meter interval.
- l) Markers or labels shall be included and laced inside termination of junction boxes, termination boxes etc.

47. Replace the existing provision of 9.4.5.1 with following

System Acceptance Tests are defined as the tests undertaken to demonstrate that the Works in its entirety is capable of functioning in accordance with the specified requirements in the Contract in all respects. The System Acceptance Tests are part of the Tests on Completion to be performed by the Contractor under the Contract in order to achieve Employer's partial Taking Over of the Works. The System Acceptance Tests may commence before remote operations capability (if any) is fully functional, however, the system must be satisfactorily tested remotely (if specified to have such capability) before the System Acceptance Tests can be considered to be completed. On satisfactory completion of the System Acceptance Tests, the tested items will be considered available for Integrated Testing & Commissioning.

Before start of System Acceptance Tests, contractor is required to perform internal system acceptance tests and submit report Contractor is required to clear and get approval from employer on at least critical and major punch points from Partial acceptance tests.

During the system acceptance tests, Employer may ask contractor to perform additional tests which Employer feel necessary to perform to analyze system performance as per TS or /and design requirement.

Integrated Testing & Commissioning are defined as the final tests to be undertaken before the commencement of Service Trial. The Integrated Testing & Commissioning are part of the Tests on Completion to be performed by the Contractor under the Contract in order to achieve Employer's Taking Over of the Works. The Integrated Testing & Commissioning shall demonstrate the full compatibility between all interfacing systems. On satisfactory completion of the Integrated Testing & Commissioning, the tested items will be considered available for Service Trial.

Taking over of the work is subject to successfully completion of integrated tests , clearance of all critical and major punch points acceptance from employer's representatives.

Before initiating Integrated test contractor is required to clear at least major and critical punch points from System acceptance test and perform internal tests and submit report to employer representative for review.

During the system acceptance tests, Employer may ask contractor to perform additional tests which Employer feel necessary to perform to analyze system performance as per TS or /and design requirement

**PART II: WORKS REQUIREMENTS, SECTION VII-B,EMPLOYERS REQUIREMENT-
TECHNICAL SPECIFICATION**

Chapter 1, General Requirement

48. LIST OF ABBREVIATIONS: “PS (Particular Specification wherever indicated in technical specification shall be read as TS (Technical Specification)”

49. Replace the provision of clause 1.1.1.2 with following

Indicative List of All Documents required:

S. No.	Document Name	Applicable	Stage of Submission
1	Fire Safety Plan	Project Wide	Before Design Submission & Approval
2	Site Management Plan	Project Wide	Before Design Submission & Approval
3	Installation Plan	Project Wide	Before Design Submission & Approval
4	Testing and Commissioning Management Plan	Project Wide	Before Design Submission & Approval
5	Defects Liability Management Plan	Project Wide	Before Design Submission & Approval
6	Maintenance Plan	Project Wide	Before Design Submission & Approval
7	Quality Management Plan, & Quality Plan	Project Wide	Before Design Submission & Approval
8	HSE Plan	Project Wide	Before Design Submission & Approval
9	Project Management Plan	Project Wide	Before Design Submission & Approval
10	Interface Management Plan	Project Wide	Before Design Submission & Approval
11	RAM Plan	Project Wide	Before Design Submission & Approval
12	Safety Plan	Project Wide	Before Design Submission & Approval
13	Knowledge Sharing Plan	Project Wide	Before Design Submission & Approval
14	EMC Plan	Project Wide	Before Design Submission & Approval
15	Design Management Plan	Project Wide	Before Design Submission & Approval
16	Software Quality Assurance Plan	Project Wide	Before Design Submission & Approval

S. No.	Document Name	Applicable	Stage of Submission
17	Procurement Management Plan (part of Manufacturing and Delivery Plan)	Project Wide	Before Design Submission & Approval
18	Transportation of Equipment Plan (part of Manufacturing and Delivery Plan)	Project Wide	Before Design Submission & Approval
19	Works Plan	Project Wide	Before Design Submission & Approval
20	COM PHA Report	Project Wide	Before Design Submission & Approval
21	COM IHA Report	Project Wide	Before Design Submission & Approval
22	COM SSHA Report	Project Wide	Before Design Submission & Approval
23	COM OSHA report	Project Wide	Before Design Submission & Approval
24	COM Hazard Log	Project Wide	Before Design Submission & Approval
25	COM Safety Case (Design Phase)	Project Wide	Before Design Submission & Approval
26	COM Safety Case (Commissioning Phase)	Project Wide	After Design Approval
27	COM RAM Analysis	Project Wide	After Design Approval
28	COM RAMS Demonstration Plan	Project Wide	After Design Approval
29	Design Verification Table and Matrix of compliance	Project Wide	
30	Conceptual Design - FOTS	Project Wide	Before Proof of Concept
31	Conceptual Design - PAS	Project Wide	Before Proof of Concept
32	Conceptual Design - PIDS	Project Wide	Before Proof of Concept
33	Conceptual Design - Master Clock System	Project Wide	Before Proof of Concept
34	Conceptual Design - CDRS	Project Wide	Before Proof of Concept
35	Conceptual Design - Telephone System	Project Wide	Before Proof of Concept
36	Conceptual Design - T - SCADA	Project Wide	Before Proof of Concept
37	Conceptual Design - Radio System	Project Wide	Before Proof of Concept
38	Conceptual Design - CCTV	Project Wide	Before Proof of Concept

S. No.	Document Name	Applicable	Stage of Submission
39	Conceptual Design - OA & IT	Project Wide	Before Proof of Concept
40	Conceptual Design - Access Control	Project Wide	Before Proof of Concept
41	Conceptual Design - Cables Power	Project Wide	Before Proof of Concept
42	Conceptual Design - Cables Data	Project Wide	Before Proof of Concept
43	Conceptual Design - Interface - Internal	Project Wide	Before Proof of Concept
44	Conceptual Design - Interface - External	Project Wide	Before Proof of Concept
45	Vendor Approval for Systems and Sub Systems		Post design Approval
46	Telephone Numbering Plan	Project Wide	Design
47	Equipment & Cable Labeling Plan	Project Wide	Before Proof of Concept
48	Preliminary Design - FOTS	Reach Wise	Design
49	Preliminary Design - PAS	Reach Wise	Design
50	Preliminary Design - PIDS	Reach Wise	Design
51	Preliminary Design - Master Clock System	Reach Wise	Design
52	Preliminary Design - Telephone System	Reach Wise	Design
53	Preliminary Design - Radio System	Reach Wise	Design
54	Preliminary Design - CCTV	Reach Wise	Design
55	Preliminary Design - OA & IT	Reach Wise	Design
56	Preliminary Design - Access Control	Reach Wise	Design
57	Preliminary Design - CDRS	Reach Wise	Design
58	Preliminary Design - T - SCADA	Reach Wise	Design
59	Detailed Design - FOTS	Reach Wise	Design
60	Detailed Design - PAS	Reach Wise	Design
61	Detailed Design - PIDS	Reach Wise	Design
62	Detailed Design - Master Clock System	Reach Wise	Design
63	Detailed Design - Telephone System	Reach Wise	Design
64	Detailed Design - Radio System	Reach Wise	Design
65	Detailed Design - CCTV	Reach Wise	Design
66	Detailed Design - OA & IT	Reach Wise	Design
67	Detailed Design - Access Control	Reach Wise	Design
68	Detailed Design - CDRS	Reach Wise	Design

S. No.	Document Name	Applicable	Stage of Submission
69	Detailed Design - T - SCADA	Reach Wise	Design
70	Detailed Design - Cables Power	Reach Wise	Design
71	Detailed Design - Cables Data	Reach Wise	Design
72	Detailed Interface Document - COMs & S&TC	Project Wide	Design
73	Detailed Interface Document - COMs & AFC	Project Wide	Design
74	Detailed Interface Document - COMs & Rolling Stock	Project Wide	Design
75	Detailed Interface Document - COMs & SCADA	Project Wide	Design
76	Detailed Interface Document - COMs & UPS	Project Wide	Design
77	Detailed Interface Document - COMs & Civil Works	Project Wide	Design
78	Detailed Interface Document - COMs & Traction Power	Project Wide	Design
79	Detailed Interface Document - COMs & MEP	Project Wide	Design
80	Detailed Interface Document - COMs & Power Supply Contractor	Project Wide	Design
81	Detailed Interface Document - COMs & Lift & Escalator	Project Wide	Design
82	Detailed Interface Document - COMs & BMS	Project Wide	Design
83	FAT Plan - FOTS	Reach Wise	Design
84	FAT Plan - PAS	Reach Wise	Design
85	FAT Plan - PIDS	Reach Wise	Design
86	FAT Plan- Master Clock System	Reach Wise	Design
87	FAT Plan - Telephone System	Reach Wise	Design
88	FAT Plan - Radio System	Reach Wise	Design
89	FAT Plan - CCTV	Reach Wise	Design
90	FAT Plan - OA & IT	Reach Wise	Design
91	FAT Plan - Access Control	Reach Wise	Design
92	FAT Plan - CDRS	Reach Wise	Design
93	FAT Plan - T - SCADA	Reach Wise	Design
94	FAT Plan - Power Cables	Reach Wise	Before Equipment Delivery
95	FAT Plan - Data Cables	Reach Wise	Before Equipment Delivery
96	FAT Plan - OFC Cables	Reach Wise	Before Equipment Delivery
97	FAT Plan - Racks Cables	Reach Wise	Before Equipment Delivery
98	FAT Plan - Mechanical Structures etc	Reach Wise	Before Equipment Delivery
99	Installation Drawing - Block Wiring Diagram - FOTS	Location Wise	Design

S. No.	Document Name	Applicable	Stage of Submission
100	Installation Drawing - Block Wiring Diagram - PAS	Location Wise	Design
101	Installation Drawing - Block Wiring Diagram - PIDS	Location Wise	Design
102	Installation Drawing - Block Wiring Diagram - Master Clock System	Location Wise	Design
103	Installation Drawing - Block Wiring Diagram - Telephone System	Location Wise	Design
104	Installation Drawing - Block Wiring Diagram - Radio System	Location Wise	Design
105	Installation Drawing - Block Wiring Diagram - CCTV	Location Wise	Design
106	Installation Drawing - Block Wiring Diagram - OA & IT	Location Wise	Design
107	Installation Drawing - Block Wiring Diagram - Access Control	Location Wise	Design
108	Installation Drawing - Block Wiring Diagram - CDRS	Location Wise	Design
109	Installation Drawing - Block Wiring Diagram - T - SCADA	Location Wise	Design
110	Installation Drawing - Equipment & Cable Layout Plan - FOTS	Location Wise	Design
111	Installation Drawing - Equipment & Cable Layout Plan - PAS	Location Wise	Design
112	Installation Drawing - Equipment & Cable Layout Plan - PIDS	Location Wise	Design
113	Installation Drawing - Equipment & Cable Layout Plan - Master Clock System	Location Wise	Design
114	Installation Drawing - Equipment & Cable Layout Plan - Telephone System	Location Wise	Design
115	Installation Drawing - Equipment & Cable Layout Plan - Radio System	Location Wise	Design
116	Installation Drawing - Equipment & Cable Layout Plan - CCTV	Location Wise	Design
117	Installation Drawing - Equipment & Cable Layout Plan - OA & IT	Location Wise	Design
118	Installation Drawing - Equipment & Cable Layout Plan - Access Control	Location Wise	Design
119	Installation Drawing - Equipment & Cable Layout Plan - CDRS	Location Wise	Design

S. No.	Document Name	Applicable	Stage of Submission
120	Installation Drawing - Equipment & Cable Layout Plan - T - SCADA	Location Wise	Design
121	System Commissioning & Configuration Plan - FOTS	Reach Wise	Before Start of Commissioning
122	System Commissioning & Configuration Plan - PAS	Reach Wise	Before Start of Commissioning
123	System Commissioning & Configuration Plan - PIDS	Reach Wise	Before Start of Commissioning
124	System Commissioning & Configuration Plan - Master Clock	Reach Wise	Before Start of Commissioning
125	System Commissioning & Configuration Plan - Telephone System	Reach Wise	Before Start of Commissioning
126	System Commissioning & Configuration Plan - Radio System	Reach Wise	Before Start of Commissioning
127	System Commissioning & Configuration Plan - CCTV	Reach Wise	Before Start of Commissioning
128	System Commissioning & Configuration Plan - OA&IT	Reach Wise	Before Start of Commissioning
129	System Commissioning & Configuration Plan - Access Control	Reach Wise	Before Start of Commissioning
130	System Commissioning & Configuration Plan - CDRS	Reach Wise	Before Start of Commissioning
131	System Commissioning & Configuration Plan - T- SCADA	Reach Wise	Before Start of Commissioning
132	Operation Manual - FOTS	Project Wide	Before Start of Commissioning
133	Operation Manual - PAS	Project Wide	Before Start of Commissioning
134	Operation Manual - PIDS	Project Wide	Before Start of Commissioning
135	Operation Manual - Master Clock	Project Wide	Before Start of Commissioning
136	Operation Manual - Telephone System	Project Wide	Before Start of Commissioning
137	Operation Manual - Radio System	Project Wide	Before Start of Commissioning
138	Operation Manual - CCTV	Project Wide	Before Start of Commissioning
139	Operation Manual - OA&IT	Project Wide	Before Start of Commissioning
140	Operation Manual - Access Control	Project Wide	Before Start of Commissioning

S. No.	Document Name	Applicable	Stage of Submission
141	Operation Manual - CDRS	Project Wide	Before Start of Commissioning
142	Operation Manual - T- SCADA	Project Wide	Before Start of Commissioning
143	Maintenance Manual - FOTS	Project Wide	Before Start of Commissioning
144	Maintenance Manual - PAS	Project Wide	Before Start of Commissioning
145	Maintenance Manual - PIDS	Project Wide	Before Start of Commissioning
146	Maintenance Manual - Master Clock	Project Wide	Before Start of Commissioning
147	Maintenance Manual - Telephone System	Project Wide	Before Start of Commissioning
148	Maintenance Manual - Radio System	Project Wide	Before Start of Commissioning
149	Maintenance Manual - CCTV	Project Wide	Before Start of Commissioning
150	Maintenance Manual - OA&IT	Project Wide	Before Start of Commissioning
151	Maintenance Manual - Access Control	Project Wide	Before Start of Commissioning
152	Maintenance Manual - CDRS	Project Wide	Before Start of Commissioning
153	Maintenance Manual - T- SCADA	Project Wide	Before Start of Commissioning
154	Preventive Maintenance Schedule	Project Wide	Before Start of Commissioning
155	Training Manual - FOTS	Project Wide	Before Training to Staff
156	Training Manual - PAS	Project Wide	Before Training to Staff
157	Training Manual - PIDS	Project Wide	Before Training to Staff
158	Training Manual - Master Clock	Project Wide	Before Training to Staff
159	Training Manual - Telephone System	Project Wide	Before Training to Staff
160	Training Manual - Radio System	Project Wide	Before Training to Staff
161	Training Manual - CCTV	Project Wide	Before Training to Staff
162	Training Manual - OA&IT	Project Wide	Before Training to Staff
163	Training Manual - Access Control	Project Wide	Before Training to Staff

S. No.	Document Name	Applicable	Stage of Submission
164	Training Manual - CDRS	Project Wide	Before Training to Staff
165	Training Manual - T- SCADA	Project Wide	Before Training to Staff
166	Method of Statement - OFC Cable Laying & Termination	Project Wide	Before Start of Installation
167	Method Statement - Power Cable Laying & Termination	Project Wide	Before Start of Installation
168	Method Statement - Secondary Containment	Project Wide	Before Start of Installation
169	Method Statement - Primary & Secondary Fixtures installation	Project Wide	Before Start of Installation
170	Method Statement - End Equipment Installation at OCC & Depot	Project Wide	Before Start of Installation
171	Method Statement - End Equipment Installation at Station	Project Wide	Before Start of Installation
172	Method Statement - Equipment Installation in Telecom Racks	Project Wide	Before Start of Installation
173	Method Statement - Equipment Installation On Board Equipment - Radio	Project Wide	Before Start of Installation
174	Method Statement - CAT 6 and Structural Cabling	Project Wide	Before Start of Installation
175	Method Statement -Radio Tower Foundation and Mast Installation	Project Wide	Before Start of Installation
176	Method Statement -Out door Equipment Installation	Project Wide	Before Start of Installation
177	Method Statement -Out door Cable Laying & Installation	Project Wide	Before Start of Installation
178	Installation Test Plan - FOTS	Reach Wise	Before Start of Installation
179	Installation Test Plan - PAS	Reach Wise	Before Start of Installation
180	Installation Test Plan- PIDS	Reach Wise	Before Start of Installation
181	Installation Test Plan - Master Clock	Reach Wise	Before Start of Installation
182	Installation Test Plan- Telephone System	Reach Wise	Before Start of Installation
183	Installation Test Plan - Radio System	Reach Wise	Before Start of Installation
184	Installation Test Plan - CCTV	Reach Wise	Before Start of Installation
185	Installation Test Plan - OA&IT	Reach Wise	Before Start of Installation
186	Installation Test Plan - Access Control	Reach Wise	Before Start of Installation
187	Installation Test Plan - CDRS	Reach Wise	Before Start of Installation
188	Installation Test Plan - T- SCADA	Reach Wise	Before Start of Installation

S. No.	Document Name	Applicable	Stage of Submission
189	Partial Acceptance Test Plan - FOTS	Reach Wise	Before Start of Commissioning
190	Partial Acceptance Test Plan - PAS	Reach Wise	Before Start of Commissioning
191	Partial Acceptance Test Plan- PIDS	Reach Wise	Before Start of Commissioning
192	Partial Acceptance Test Plan - Master Clock	Reach Wise	Before Start of Commissioning
193	Partial Acceptance Test Plan- Telephone System	Reach Wise	Before Start of Commissioning
194	Partial Acceptance Test Plan - Radio System	Reach Wise	Before Start of Commissioning
195	Partial Acceptance Test Plan - CCTV	Reach Wise	Before Start of Commissioning
196	Partial Acceptance Test Plan - OA&IT	Reach Wise	Before Start of Commissioning
197	Partial Acceptance Test Plan - Access Control	Reach Wise	Before Start of Commissioning
198	Partial Acceptance Test Plan - CDRS	Reach Wise	Before Start of Commissioning
199	Partial Acceptance Test Plan - T- SCADA	Reach Wise	Before Start of Commissioning
200	Partial Acceptance Test Plan - FOTS	Reach Wise	Before Start of Commissioning
201	System Acceptance Test Plan - PAS	Reach Wise	Before Start of Commissioning
202	System Acceptance Test Plan- PIDS	Reach Wise	Before Start of Commissioning
203	System Acceptance Test Plan - Master Clock	Reach Wise	Before Start of Commissioning
204	System Acceptance Test Plan- Telephone System	Reach Wise	Before Start of Commissioning
205	System Acceptance Test Plan - Radio System	Reach Wise	Before Start of Commissioning
206	System Acceptance Test Plan - CCTV	Reach Wise	Before Start of Commissioning
207	System Acceptance Test Plan - OA&IT	Reach Wise	Before Start of Commissioning
208	System Acceptance Test Plan - Access Control	Reach Wise	Before Start of Commissioning
209	System Acceptance Test Plan - CDRS	Reach Wise	Before Start of Commissioning
210	System Acceptance Test Plan - T- SCADA	Reach Wise	Before Start of Commissioning
211	Integrated Tests Plan - COMs & S&TC	Reach Wise	Before Start of Commissioning

S. No.	Document Name	Applicable	Stage of Submission
212	Integrated Tests Plan - COMs & AFC	Reach Wise	Before Start of Commissioning
213	Integrated Tests Plan- COMs & Rolling Stock	Reach Wise	Before Start of Commissioning
214	Integrated Tests Plan- COMs & SCADA	Reach Wise	Before Start of Commissioning
215	Integrated Tests Plan - COMs & UPS	Reach Wise	Before Start of Commissioning
216	Integrated Tests Plan- COMs & Civil Works	Reach Wise	Before Start of Commissioning
217	Integrated Tests Plan - COMs & Traction Power	Reach Wise	Before Start of Commissioning
218	Integrated Tests Plan- COMs & MEP	Reach Wise	Before Start of Commissioning
219	Integrated Tests Plan COMs & Power Supply Contractor	Reach Wise	Before Start of Commissioning
220	Integrated Tests Plan - COMs & Lift & Escalator	Reach Wise	Before Start of Commissioning
221	Integrated Tests Plan- COMs & BMS	Reach Wise	Before Start of Commissioning
222	Handover Report & Document fro Approval	Reach Wise	Before Start of Commissioning
222	Tests Reports	Location Wise	
222	Monthly Progress Reports	Project Wide	Every Month

50. **Para 1.1.1.3: replace** “ The Technical Specification is divided into Nine chapters:” with “The Technical Specification is divided into Twelve chapters”

51. **Replace the provision of 1.1.3.1 with following**

Employer’s drawings are enclosed in consist of **Part II Section VII C: Reference Documents/Drawings: Details of drawings enclosed are as under**

Folder name	Sl. No	Document Name
NMRCL General Alignment Diagram Updated 23.07.2016	1	At-Grade GAD Layout
	2	Reach 1 GAD Layout
	3	Reach 2 GAD Layout
	4	Reach 3 GAD Layout
	5	Reach 4 GAD Layout
	6	Khapri Station
	7	New airport and South Airport Stations

Folder name	Sl. No	Document Name
NMRCL All Tentative Station Drawings of Reach 1 stations and Depot	8	Airport Station
	9	Ujjwal nagar Station
	10	Jaiprakash nagar Station
	11	Chatrapathi square Station
	12	Ajni Square Station
	13	Rahate Colony Station
	14	Congress nagar Station
	15	Tentative Drawing of Mihan Depot

The accuracy of preliminary details shown on the drawings can't be guaranteed and should be treated accordingly.

52. Replace the provision of 1.1.4.1 with following

The Sub-system and its constituent parts shall comply with the relevant latest version of British Standards, International Electromechanical Commission (IEC) standards, International Organization for Specification (ISO) Standards, European Standard (EN) or UL Standards (Underwriters Laboratory) etc. as specified below:

Safety of information technology equipment, including electrical business equipment.	EN 60950-1:2006
Power Transformers	IEC 60076, EN 60076
Protection Class for Components	As specified for individual equipment in this TS.
Surge Protective Devices	IEC 61643 – 1
EMC – Immunity	IEC 60801, EN 60801
EMC – Emission	VDE 0875, IEC 60555, EN 60555
Electromagnetic compatibility Testing and Measurement Techniques	IEC 61000-4, EN 61000-4, BS EN 50121
Inter system EMC	EN 50082, EN 50121, EN 50123, EN 50155, IEC 571, IEC 1000 or equivalent
RFI Suppression	EN55022A or VDE 0878
Level measuring systems utilizing ionising radiation with continuous or switching output	IEC 60982
Sound Level of Noise Source	ISO 3746, BS 4196–6

Flammability Tests	IEC 60707
Valve Regulated Sealed Lead Acid Rechargeable Single Cells	IRS: S93-96, DOT: TQ510G 92
Low-voltage Switchgear and Control gear Assemblies	IEC 60439 – 1, EN 60439–1
Low-voltage Switchgear and Control gear	IEC 60947, EN 60947, IEC947-3, IEC 60898 or EN 60898
Specification for contactors	IEC60947 – 4, EN 60947-4
Describes the Characteristics of Railway Systems that affect EMC behavior	EN 50121-1
Applies to Signalling & telecommunication apparatus installed in railway environment	EN 50121-4
To establish a common reference for evaluating the performance of industrial-process measurement and control instrumentation when exposed to electric or electromagnetic interference requirements for Electrical Installations. IET Wiring Regulations	IEC 1000-4
	BS 7671
IEC 61643-22:2015 describes the principles for the selection, operation, location and coordination of SPDs connected to telecommunication and signaling networks	IEC 61643-22
BS 5839-8:2013 gives recommendations for the design, installation, commissioning and maintenance of voice alarm systems which automatically broadcast speech or warning tones, in response to signals from their associated fire detection and fire alarm systems.	BS 5839-8
Specifies general requirements for third-party operating a product certification system	IEC 17065:2012
IEC 62290-1:2014 provides an introduction to the standard and deals with the main concepts, the system definition, the principles and the basic functions of UGTMSs (Urban Guided Transport Management and Command/Control Systems).	IEC 62290-1 2014
BS EN 61386-1:2008 specifies requirements and tests for conduit systems, including conduits and conduit fittings, for the protection and management of insulated conductors and/or cables in electrical installations	EN 61386-1:2008
Electric cables. Single core unsheathed heat resisting cables for voltages up to and including 450/750 V, for internal wiring.	BS EN 50525-1:2011, BS EN 50525-2-41:2011, BS EN 50525-2-42:2011

General requirements for rotating electrical machines. Classification of degrees of protection provided by enclosures for rotating machinery	BS EN 60034-5:2001, IEC 60034-5:2000
Electrical Relays - Single Input Energizing Quantity Measuring Relays With Dependent Specified Time	IEC 60255-3 Ed. 2.0

53. Replace the provision of 1.1.5 (1) with following

For efficient Metro railway management and operation, it is essential to have a well-organized telecommunication network covering strategic locations like OCC/BCC, Metro Bhavan, passenger stations, subway, depot, and it is equally essential to have reliable links between the strategic locations and moving trains or working staff along the railway track.

54. Replace the provision of 1.1.5 (2) with following

The FOTS and Wide Area Network being provided under FOTS Sub-system of Contract N1TL01 shall provide all necessary communication channels for carrying voice, data, and video signals for Metro railway management and operation from Station/Depot TER to OCC/BCC CER.

55. Delete para 1.1.5 (11)

56. Add para 1.1.5 (13) with details as under

OA&IT System (Only LAN & Networking Hardware) at stations, RSS, Depot & OCC/BCC. Details provided under chapter 9 FOTS

57. Replace the provision of 1.2 with following

The system integrator (SI) shall be responsible for co-ordination & liaisoning with all communication sub-system contractors for engineering, review of system design, interface design, Testing & Commissioning of all communication sub-systems etc. in co-ordination with individual sub-system contractors. The SI shall be responsible for fulfilling all functionalities, interfaces, as also final testing & commissioning of all communication sub-systems in co-ordination with all sub-system contractors.

The SI shall provide UPS DB (Distribution Board) in rooms like OCC Theater, SCR, DCC and any other major equipment room for further distribution of UPS power to HMIs & other equipment pertaining to Communication System in these rooms, The UPS DB shall be fed from the main UPS DB provided by designated contractor in TER at stations & CER at OCC.

All communication sub-system vendors, in addition to ensuring compliance to functionalities pertaining to the concerned sub-systems as defined in this TS, shall also be responsible to provide all information & documentation required by the SI, to enable him co-

ordinate design review & associated activities to enable proper testing & commissioning of all communication sub-system.

Basic Roll of System Integrator

- Process analysis
- Solution design
- Product and vendor selection
- Solution development
- New technology adaptation
- Solution integration, testing, maintenance and support
- Project management
- Training
- Support

Creation of these information systems may include designing or building a customized architecture or application, integrating it with new or existing hardware, packaged and custom software, and communications infrastructure.

System Integrator to realize interface with Telecom sub system and other railway systems for seamless transfer and convergence of voice and data.

58. Replace the provision of 1.3.3.2 (2) with following

Design, Supply and Installation of Base Frame, under False Floor Cable Trays with required risers for wall mounted units in TER of Stations/Depot and under false floor cable trays in SCR. List of Stations (The scope of N1TL01 Contractor) is given in Appendix C of chapter 12.

59. Replace the provision of 1.3.8 with following

The N1TL01 Contractor shall be provided space to set up Project Office and Storage Space for telecom segments. N1TL01 shall necessarily have to station at this Project Site Office throughout the contract period, the key personnel for design and implementation- co-ordination etc. and shall submit a list for the same to review.

60. Add para 1.3.10 with details as under

The Contractor shall provide, as a minimum, the following furniture at each TER, each Security Control Room, CER and Telecom Lab containing Telecom equipment at station, depot and OCC/BCC

- a. Computer desks for the Workstations and Local Control terminals
- b. Office chairs for the operators and the maintainers;
- c. Storage cabinets for drawings, manuals and site spare parts
- d. Appropriate Ladder/safety harness kit for working at height for maintenance of the system at stations, depots, OCC etc.

The final requirement will be freezed in consultation with employer's representative

Specification:

HMI Work Station Table:

- CPU to be placed in the cabinet with lockable shutter.
- Cable Manager to be provided
- Socket for Power & Data ports to be provided.
- Under table key board tray.

Chair

- Low Mesh back chair in knee tilt
- Multi lock Mechanism
- Gas lift
- Two way adjustable Arms with soft cushion padding.
- Fine tuning adjustable lumber support.
- Ergonomic back.

Amirah

- At least having 4 shelves
- Modular type
- Good gauge Metal made with powder coated.

61. Replace the provision of 1.4.4.12 with following

The contractor shall submit Maintainability plan to the Employer's Representative for review in accordance with RAMS Plan as per attached Format 1.1 & Format 1.2.

Format 1.1 (*The Tenderer shall declare the MTBF of the major systems listed below*)

No	System / Equipment	MTBF (Hours)
1	FOTS	
a	Core Switch	>150,000
b	Distribution Switch	>150,000
c	Access Switch	>150,000
2	TETRA	
a	TETRA Switch	>150,000
b	Base Station	>150,000
c	Train Radio Unit	>150,000
d	Radio Control Panel (RCP)	>100,000
e	Hand Held Portable Radio	>150,000
f	Radio Despatcher Workstation (RDW)	>50,000

3	CCTV	
a	Central & Station Server and Central Equipment	> 50,000
b	DAS	> 50,000
c	Camera	> 60,000
d	NVR Server & Data Base	> 60,000
e	MMI	> 50,000
4	Telephone	
a	Processor Module	> 200,000
b	Line and Trunk Interface Module	> 100,000
c	Switching Module	> 150,000
d	IP Cards	
e	Memory Module	> 200,000
f	Power supply equipment	> 50,000
g	Multifunction direct line console	> 50,000
h	Network Management system	> 50,000
5	PIDS	
a	PIDS Server	>50,000
b	PIDS Display	>50,000
c	PIDS / PAS Workstation	>50,000
6	PAS	
a	System Controller	> 60,000 Hours
b	Amplifier	> 60,000 Hours
c	Speaker	> 50,000 Hours
d	Digital Voice announcer equipment	> 60,000 Hours
e	PAS Management System	> 50,000 Hours
f	PIDS/PAS HMI + Station Server	> 50,000 Hours
g	Back up Console	> 100,000 Hours
h	Noise Sensors	> 50,000 Hours

7	Clock	
a	Master Clock Server	> 50,000 Hours
b	Sub Master Clock Server	> 50,000 Hours
c	GPS Receiver and antenna	> 50,000 Hours
d	Slave Clocks	> 30,000 Hours
8	CDRS	
a	Server	> 50,000 Hours
9	ACIDS	
a	Server	.> 50,000 Hours
b	Door Control Cards	.> 60,000 Hours
c	Ingress Button, Break Glass, Key Switch , Sensors, Locks	.> 60,000 Hours

Format 1.2: MTTR and Maintainability of the key systems

(The Tenderer shall declare the MTTR of the identified key systems)

Note: Tenderer(s) shall submit details of how quickly various Systems/Sub-Systems can be restored/re-booted or by-passed.

S. No	System / Equipment	MTTR (hours)
1	FOTS GE Equipment	4
2	Radio System	4
3	CCTV System	4
4	Telephone System	4
5	PIDS	4
6	PAS	4
7	Master Clock System	4
8	Central digital Voice Recording System (CDRS)	4
9	ACIDS	4
10	Network Management System	4

62. Replace the provision of 1.6.1.2.1 with following

The Contractor shall submit detailed design calculations and supporting drawings, documents, etc., for the system to the Employer's Representative for review.

Contractor to submit Design Verification Table for Technical Specification during preliminary design submission.

63. Addition the provision of 1.6.2.1.6 with following

N1TL01 to ensure that all Power Supply Units , Controller Cards, Data Termination Cards of PIDS , CCTV, PA , ACIDS, Help Points and other Telecom equipment to be installed at Outdoor or Station's Platform environment shall be made of industrial grade components which shall be suitable to operate under extreme Operating Temperature.

64. Add para 1.7.3 with details as under

Contractor shall submit Interface Management Plan for Employer review. Tentative Interfaces between the Communication System, sub-systems and other Systems, which are anticipated, are listed in the following table

Non - Telecom System -	Rolling Stock	AFC	SCADA	UPS	Lift	Civil Works	S&TC	BMS	PSTN	NMRC -IT	E&M
FOTS	√	√	√	√	√	√		√			√
PAS	√			√	√	√	√	√			
PIDS	√			√		√	√	√			
CCTV	√	√		√	√	√	√	√			
Radio	√			√		√					
Telephone				√	√	√			√		
MCK	√	√	√	√		√	√	√		√	√
Access Control		√		√		√		√			
CDRS				√							
OA&IT				√						√	
T-SACADA				√							
Cables											√

System - Telecom	FOTS	PAS	PIDS	CCTV	Radio	Telephone	MC K	Access Control	CDRS	T-SACADA
FOTS		√	√	√	√	√	√	√	√	√
OA&IT	√						√			
PAS	√		√		√	√	√		√	√
PIDS	√	√		√			√			√
CCTV	√		√				√	√		√
Radio	√	√				√	√		√	√
Telephone	√	√			√		√		√	√
MCK	√	√	√	√	√	√	√	√	√	√

Acces Control	√			√			√			√
CDRS	√	√			√	√	√			√
T-SACADA	√	√	√	√	√	√	√	√	√	

65. Replace the provision of 1.8.1.1 with following

The Contractor shall perform stage-wise testing and commissioning activities in accordance with the requirements given in this Specification. Order of priority of commissioning is (1.) Priority Section. (2.) Reach-1, (3.) Reach -3, (4.) Reach 2, (5.) Reach 4.

66. Replace the provision of 1.8.4.1 with following

General: The Contractor shall prepare and submit to the Employer's Representative for review an On-site Testing and Commissioning Plan.

For Priority Section

- a. Contractor is required to pre – configure all equipment, server & work station at the time of FAT. These pre – configure systems should be brought at site with plug and play ready.
- b. All the equipment will be commissioned in standalone mode.
- c. At the employer discretion, Priority section may be commissioned based on preliminary design without POC, however if any change is required based on outcome of POC/Detailed design, contractor need to change/modify the equipment accordingly without any cost impact to NMRCL.

67. Add para 1.8.4.3.1 (5) with details as under

Contractor to submit Method Statement for installation of cable, equipment, secondary containment, Fixtures, cable terminations etc, along with design document for employer's review.

Contractor shall offer Installation Tests based on approved method statements and Installation Tests Procedures.

68. Add para 1.10.1.13 with details as under

- a) Secondary Cable tray to be provided by N1TL01.
- b) Metallic cable trays shall be compliant with NEMA VE-1 and cable trays shall be manufactured from mild steel and hot-dip galvanized per ASTM-A653 or other approved standard for general applications as approved by employer.
- c) Under floor, skirting, wall trunking and high level ceiling trunking shall be provided in accordance with the highest standards, and shall be of the steel type with steel covers that are hot dip galvanised or zinc plated finish.
- d) Equipment fixtures , trucking, bends, tee sections and offsets shall be coupled together by means of fish plates and bolted together using cadmium plated steel set screws, nuts and shake proof washers in accordance with the employer s Recommendations.

- e) Conduit and fittings requiring „Class 2“ level of corrosion protection shall be finished in black enamel and conduit and fittings requiring Class 4“ shall be, hot dipped galvanised.
- f) All junction box shall be corrosion protected Class 4 as defined in EN 50086.
- g) All Communication equipment housing, fixtures shall be fastened by spring washer type fasteners. Contractor to take sample approval from employer representative.
- h) Interior of cabinets or boxes, all exposed screws shall be Stainless steel flat or oval head.
- i) Where an aluminum component is to be joined to a steel component, steel rivets, hot formed shall be employed. Alternatively, an accepted type of steel fastener shall be used, suitably protected against corrosion.
- j) The design strengths for ANSI Grade 2 or equivalent bolts and Class A or equivalent nuts shall be used in sizing the mounting and attachment bolts for under floor-mounted equipment and equipment support structures or brackets. However, all structural or load carrying bolts shall be a minimum of ANSI Grade 5 or equivalent.
- k) Plated steel screws or bolts, nuts, flat washers and lock washers, with both the steel and plating suitable for use in high temperatures without degradation of the strength of the hardware or its resistance to corrosion, shall be used in mounting, and in making connections to, resistors and other heat-producing apparatus.

69. Add para 1.10.1.14 with details as under

All cable laying, cable termination, containment laying, fixture and equipment installation to be done as per approved method statements.

CAT 6E STP Cable shall comply with all standards of structural cabling. Contractor to propose installation material and accessories as per design.

Contractor to submit all method statements for Employer’s representative review at least 3 months prior to commencement of the work.

70. Replace the provision of 1.10.4.6.4 with following

At elevated sections HDPE Duct (LSZH – UV Protected) shall be installed in the ducts provided by Project Contractors

71. Replace the provision of 1.10.7 with following

Phase 415 V AC from the UPS, to meet the requirement of Telecom, AFC and Signalling Contract shall be provided by N1S01 Contractor in UPS (S&T) Room. N1TL01 Contractor shall extend the AC Power supply from UPS Rooms to TER/CER. The AC distribution system provided by N1TL01 contractor shall meet with the requirements of all Telecom and IT sub-systems. Distribution circuits shall be suitably protected with MCBs, Earth Leakage Detectors and SPDs etc.. Adequate no. of spare circuits of each type for each sub-system shall also be provided in the distribution system by N1TL01. The further cabling from AC Distribution cubicle to Equipment Racks and other required locations for powering equipment’s to be supplied and commissioned by the N1TL01 contractor for all the equipment’s.

N1TL01 Contractor shall work out actual load and circuit requirements for stations/Depot/OCC and shall submit the design of the AC power distribution systems for each stations /depot / OCC for review by the Employer’s Representative. The ratings of switch

gears, cables etc. should have appropriate safety margin/de-rating factors. N1TL01 contractor shall lay a spare power cable from UPS distribution to TER distribution. Spare cables as above shall be of the same capacity as the cables in use. The interface to all the required sub-systems will be through MCBs in DC Distribution Board. The N1TL01 contractor shall lay individual cables from Distribution Board to the respective Equipment Racks for powering equipment to be supplied and commissioned under N1TL01 Contract, duly taking care of the load requirement of AC Power supply.

72. Replace the provision of 1.11.5.1.1 with following.

N1TL01 shall be responsible for supervised maintenance during the DLP period . N1TL01 shall depute experience maintenance supervisor at site to guide, help & support maintenance personal of NMRCL in maintenance, attending to defect/repairs etc.

73. Replace the provision of 1.17 with following

Proof of Concept: Tenderer are requested to demonstrate a POC (Proof of Concept) for FOTS, CCTV, Telephone System, PAS/PIDS and Radio system before commencing detailed design. The vendor shall set-up a prototype test set up to demonstrate major functionalities as specified in TS including Redundancy levels, Traffic analysis, Convergence Time, Latency, Synchronization, Interfaces & Integration etc.

At employer's discretion contractor may be allowed to install & Commission the equipment without POC, however if any change is required after demonstration of POC subsequently, Contractor will be required to change/modify the equipment at no extra cost to employer.

74. Add Annexure 1 with details as under

Details of entry/exit, RSS, parking, coordinate etc are as under

N-S corridor			
S. No.	Station Name	GPS Coordinate	
		latitude	longitude
Reach2			
1	Automotive Square	21°11'15.95"N	79° 7'19.10"E
2	Nari Road	21°10'46.51"N	79° 6'38.67"E
3	Indora Chowk	21°10'25.37"N	79° 6'3.03"E
4	Kadvi Chowk	21°10'7.13"N	79° 5'32.61"E
5	Gaddi Godam Sq	21° 9'40.25"N	79° 5'0.64"E
6	Kasturchand Park	21° 9'15.29"N	79° 4'53.18"E
7	Zero Mile	21° 8'42.84"N	79° 4'50.51"E
8	Sitaburdi(Interchange)	21° 8'28.94"N	79° 4'57.52"E

Reach 1			
9	Congress Nagar	21° 7'55.83"N	79° 4'59.91"E
10	Rahate Colony	21° 7'36.18"N	79° 4'31.55"E
11	Ajani Square	21° 7'5.76"N	79° 4'19.70"E
12	Chatrapati Square	21° 6'33.08"N	79° 4'10.71"E
13	Jaiprakash Nagar	21° 6'12.81"N	79° 4'5.35"E
14	Ujwal Nagar	21° 5'47.62"N	79° 3'59.29"E
15	Airport	21° 5'10.50"N	79° 3'49.73"E
Depot	Mihan Depot	21° 2'28.07"N	79° 2'33.09"E
RSS	Munje Chauk (Twin RSS)	21° 8'28.94"N	79° 4'57.52"E
Priority Section			
16	South Airport		
17	New Airport	21° 3'57.21"N	79° 3'20.16"E
18	Khapari	21° 2'49.95"N	79° 2'49.58"E
E-W corridor			
Reach 4			
1	Prajapati Nagar	21° 9'1.33"N	79° 8'57.22"E
2	Vaishno Devi Chowk	21° 8'52.67"N	79° 8'11.49"E
3	Ambedkar Chowk	21° 8'53.88"N	79° 7'46.56"E
4	Telephone Exchange	21° 8'55.54"N	79° 7'5.18"E
5	Chittar Oli Chowk	21° 8'58.64"N	79° 6'37.46"E
6	Agarsen Chowk	21° 9'3.69"N	79° 6'9.77"E
7	Dosar Vaisya Chowk	21° 9'10.45"N	79° 5'41.88"E
8	Nagpur Railway Stn	21° 8'57.43"N	79° 5'24.48"E
9	Sitaburdi(Interchange)	21° 8'29.76"N	79° 4'59.99"E
Reach 3			
10	Jhansi Rani Square	21° 8'25.75"N	79° 4'38.53"E
11	Institute Of Engineers	21° 8'18.31"N	79° 4'13.76"E
12	Shankar Nagar Square	21° 8'10.04"N	79° 3'41.55"E
13	LAD Chowk	21° 7'58.12"N	79° 3'17.13"E
14	Dharampeth College	21° 7'43.53"N	79° 2'44.97"E
15	Subhash Nagar	21° 7'23.76"N	79° 2'27.88"E
16	Rachna Ring Road Jn.	21° 7'17.20"N	79° 1'45.10"E

17	Vasdev Nagar	21° 7'8.72"N	79° 1'12.86"E
18	Bansi Nagar	21° 6'56.42"N	79° 0'43.26"E
19	Lokmanya Nagar	21° 6'30.34"N	78°59'52.62"E
Depot	Hingna Depot	21° 6'6.26"N	78°59'37.91"E
OCC	Sitaburdi(Interchange)	21° 8'28.94"N	79° 4'57.52"E
BCC/HQ	Deeksha Bhoomi		
No. Of Parking			
S.No.	NS Corridor	No. of Parking	Parking Area (Sq.m)
1	Kadvi Chowk	1	1038.84
2	Kasturchand Park	1	7285
3	Sitaburdi (Interchange)	1	25897
4	Congress Nagar	1	2015.15
5	Rahate Colony	1	5280.83
6	Ajani Square	1	4894.32
7	Chatrapati Square	1	4555
8	Jaiprakash Nagar	1	16651.25
9	Ujwal Nagar	1	7020
10	Airport	1	4844
11	New Airport	1	5250
12	Khapari	1	5300
	EW Corridor	No. of Parking	Parking Area (Sq.m)
1	Prajapati Nagar	1	1876
2	Jhansi Rani Square	1	3423
3	Shankar Nagar Square	1	7065
4	Ambazari lake View station	1	1667
5	Rachna Ring Road Jn.	1	3870
6	Lokmanya Nagar	2	2868.74
			1044.06
Station Entry/Exit Details Reach-1			
S. No.	Station	No. of Entry	No. of Exit
1	Congress Nagar	1	1
2	Rahate Colony	1	1
3	Ajani Square	1	1

4	Chatrapati Square	2	2
5	Jaiprakash Nagar	2	2
6	Ujwal Nagar	2	2
7	Airport	1	1
8	South Airport	1	1
9	New Airport	1	1
10	Khapari	1	1

Note: Above mentioned details are tentative for few station only for guidelines. details will be finalised during Detailed Design.

Chapter 2, PA System

75. Replace the provision of 2.1.2.5 (1) with following

Wall mountable Station Announcement Equipment at each Platform.

76. Add following provision in Para 2.1.3

This is N1TL01 contractor's responsibility to interface with S&TC contractor to realize integrated PAS/ PIDS information for scenario based train movement e.g Bunching of Trains, Bi directional Train Movement, short loop train movement, Non Stopping Trains, intermediate station as terminal station etc. The details to be finalized during detailed design / interface design

77. Replace the provision in Para 2.2 with following

PAS System Locations: PA system shall broadly provide coverage to the following locations

- a) Stations: Platforms, Concourses (both Paid & Unpaid), Commercial Areas, Ticket Gates, Gate Lines , Elevators , Escalator Landings , Staircases, Entrances, Exits, Sky walks (wherever applicable), Security Checking Machines, Cash Transfer Routes, Evacuation Routes, Parking areas, Back of House Rooms, wash rooms , Equipment , Operational & Administrative rooms , Station Control Room, Station boundaries , Entry to via-duct and Via - duct (over view) , vicinity of station area (entry I exit structures , road side ,nearby areas etc.) Technical Rooms, SCR, Security Room, ASS, Walk Ways, Station Manager Room, TOM etc.
- b) Depots: Operational & Administrative rooms, DCC room, Back of House Rooms incl. wash rooms, Equipment Rooms, Elevators, Staircases, Entrances, Exits, Security Checking Machines, Evacuation Routes, Parking areas, Depot boundaries (Perimeter), Train Entry I Exit from main line (via-duct), Level Crossings, Workshops, Plant rooms, Stabling Lines, Inspection lines, Test track, Assembly points.
- c) Operational Control Centre (OCC): Operational & Administrative rooms, OCC theatre room, Back of House Rooms incl. wash rooms, Equipment Rooms, Elevators, Staircases,

Entrances, Exits, Security Checking Machines, Evacuation Routes, Parking areas, Plant rooms

78. Replace the provision of 2.3.2 (1)) with following

Integrated PAS/PIDS control equipment. Contractor may propose integrated HMI and / or control system for PAS & PIDS for better synchronization between the two systems.

Note: Bidder may propose Integrated PAS/PIDS Control Equipment, HMI under PAS or PIDS, however it is the responsibility of N1TL01 contractor to provide seamless integrated system.

79. Add following provision under new Para 2.3.2 (22)

Administrative Building: The administrative building shall be provided with arrangements for making emergency announcements in important rooms and the premises of the administrative building. The Contractor shall tentatively assume provision of speakers in 50 rooms/locations, connected to the main PA server in the OCC, for the administrative building. A fully equipped PAS panel shall be provided separately for making announcements in the administrative building

80. Replace the provision of 2.3.3.2 with following

NMRCL shall be operated from OCC. For implementation of PAS on this line, N1TL01 will be required to provide a PIDS/PAS server to interface to the ATS System. Contractor may provide integrated PAS & PIDS Server.

The N1TL01 contractor has to provide the detailed strategy to the employer for installation of equipment at OCC. The Main and Backup MMI shall be provided as under:

- (a) The main MMI's shall be provided at OCC
- (b) For Backup MMI for OCC, N1TL01 contractor shall provide backup MMI for the OCC at locations which shall be specified later.
- (c) One hard wired PA Control panel, complete with microphone and zone selections shall be provided in OCC, and SCR (Station Control Room) and SSR (Station Security Room) of each station for announcement in the station area so that, in case of emergency, announcement can be done in each zone / all zones. One Wireless Microphone shall be provided at every platform, docking type Power Charger for Wireless Microphone shall be located at nominated location of platform. Proper Antenna shall be provided to for Wireless Micro phone so that it will have coverage /range in entire Platform Area

The PAS System shall provide uniform broadcast coverage throughout all areas of each site within which staff o members of the public may gain access to. The design shall be such that the speakers are so located as to ensure that there are no dead zones between adjacent speakers due to interference or any other reason

- (d) In addition, the N1TL01 contractor shall co-ordinate with Civil Works Project Contractors and provide comments or recommendations on subject of station building materials, finishes and architectural layouts, for best acoustic performance.

81. Replace the provision of 2.4.1.4 with following

The PAS shall adopt a sound pressure level compatible with the stations architectural design and the associated acoustics with recessed type speakers for false ceiling areas and wall or surface mounted type speakers for non-false ceiling areas. Last mile conduits shall be made of LSZH / nontoxic material.

Expose cabling and conduiting, secondary containment shall not be allowed. Speaker installation shall be aesthetically suitable to station / OCC / depot built.

Speaker under the viaduct at station area may be opted .as pre casted holes under the viaduct. This may be arranged by N01TL01 by placing request in advance to Viaduct contractor.

82. Replace the provision of 2.4.1. 6 (e) with following

The Acoustic Consultancy shall submit a report, for approval of the Employer, on the STIPA performance of each site (Similar architectural site may be grouped to-gather and one station from each group may be selected for STIP report) which shall inter-alia include the following:

- i. The PA speaker distribution, speak types required and speaker level settings per broadcast zone;
- ii. The resulting PA Amplifications;
- iii. Recommendations on the material characteristics to be used with the architectural fabric of the site and any acoustic treatment, which may be required to achieve the specified STIPA performance.

83. Replace the provision of 2.4.1.9.1 with following

The processing and switching delay contributed by the PAS equipment shall not exceed 250 ms for any type of commands.

The response time of PAS equipment shall include switching time and handover time of FOTS network

84. Replace the provision of 2.4.1.10.2 & 2.4.1.10.3 with following

2.4.1.10.2: The loudspeakers used shall comply with all relevant provisions of the EN/IEC 60065

2.4.1.10.3: The loudspeakers shall be capable of operating safely within an ambient temperature range suitable for the city. Minimum Temp range -5°C to +55°C shall be considered.

85. Replace the provision of 2.4.3.1 & 2.4.3.2 with following

2.4.3.1: In determining the Availability of the PAS, reliability block diagrams using field rates for commercially available equipment shall be produced. Any equipment without field failure data shall have its failure rate determined strictly in accordance with BS & EN Standard for its appropriate operating environment.

2.4.3.2: PAS announcement initiated by any mode of operation shall be considered unavailable under the following failure conditions as a minimum:

1. Failure of both, main MMI and its backup MMI at the OCC and BCC;
2. Failure of PAS MMI at any station;
3. Failure of one or more PAS control panel at any location;
4. Failure of co-ordinate message capabilities with the PIDS at any location;
5. Failure of audio broadcasts although initiated by the Train Control and Signalling (TC&S) System at any location; and
6. Failure of more than 50% of PAS loudspeakers of a zone or more at any location
7. Failure of Live Announcement from HMI or /and back up console
8. Failure of Platform Announcement Equipment
9. Failure of Emergency message broad triggered from Fire Management System

86. Replace the provision of 2.4.5.2 with following

All equipment must comply with and be installed in accordance with ISO/IEC 17065:2012, IEC 364 and to current safety standards applicable in India.

87. Replace the provision of 2.5.2.1 (2) with following

Automatic mode based on information from the TC&S System for train related information broadcast. And Automatic mode based on information/trigger from Fire alarm system for emergency evacuation message.

88. Replace the provision of 2.5.3.3.1 with following

The contractor shall develop full details of the PAS zone assignment for full coverage of workshops, servicing shed(s), Staff areas including office rooms, equipment rooms, plant rooms and covered stabling lines, inspection lines and submit to the employer's representative for review.

89. Replace the provision of 2.5.4.1.5 with following

Each Platform Announcement Device shall be provided with a wireless microphone. The PAS control panel shall have the facilities to make live broadcast to Pre-Defined Platform Zone

90. Replace the provision of 2.5.4.2.2 with following

Multi – drop data links/ Multi cast (TCP/IP) of adequate bandwidth through FOTS shall be provided to each station PAS allowing the OCC to broadcast messages to the following as a minimum:

- (1) One station
- (2) A group of stations
- (3) All stations

91. Replace the provision of 2.5.4.4.1 with following

On detection of fire alarm, operator in SCR / Platform Announcement Device /Security Room can also manually make live announcements to alert the passengers and staff and broadcast evacuation message.

92. Replace the provision of 2.5.10.1.1.14 with following

The SCR MMI shall receive notification of any message initiated from the microphone broadcast from the Platform Announcement Device

93. Replace the provision of 2.5.10.1.1.17 with following

The PAS/PIDS MMI at OCC, BCC, Stations should be minimum 20” Touchscreen & PAS Back up Console shall have minimum 5” Touchscreen.

94. Replace the provision of 2.5.10.2 with following

For OCC, N1T01 contractor shall provide Backup MMI. No Backup MMI is foreseen and required at stations. It is envisaged that with a single MMI, the RAMS requirements shall be attained. The contractor shall demonstrate this in the RAMS and PAS design submission.

Design details to be submitted to the employer’s representative for review. Refer to MMI Provision Schedule at Section VII B Chapter 12

95. Replace the provision of 2.5.10.4.1 with following

Each station Platform Announcement Device shall be provided with a Wireless Microphone to gain access to its associated platform(s).

96. Replace the provision of 2.5.10.4.4 with following

Deleted

97. Addition the provision of 2.5.10.4.5 with following

Platform Announcement Device shall be having wireless Mic. N1TL01 to propose wireless system compatible to free band as defined by WPC or DOT in general bands or ranges in VHF: Device shall be having deviation (+/_12 KHz) allow high quality audio transmission , power shall be limited to 50 mw.

98. Replace the provision of 2.5.12.1.1 with following

The PAS / PIDS NMS shall monitor system alarm status on real time basis; alarm data shall also be stored for future inquiries. It is envisaged that one NMS and a corresponding workstation shall be provided. The NMS at OCC shall have jurisdiction over station to depot station and shall extend a workstation to OCC. The NMS should not be available for access in other than CSS / CER. The PAS and PIDS NMS shall be on the same server / workstation. However, no monitoring or control of depot PAS system is required as it is a standalone system. Or Bidder may propose Virtualized solution by having all services applications, Database, Management servers including other system applications in Virtualized manner to optimize the solution hardware etc as per bidder design. Virtual Machine solution must not

lead to single point of failure and must be design with proper redundancy. Contract to ensure backup server for virtual machines in the network in such a way that all service profiles / data base gets updated automatically with in the network which is getting connected live to the network and work in N:1 redundancy in case of catastrophic failure of the central/Station server. In case of degraded mode all data / software and configuration should be secured and recoverable from redundant server. Contractor to mention recovery of configuration in the document clearly for review. In case of failure In such case Subsystem/system redundant software shall be residing in separate server other than primary application server which should work in Hot standby mode.

99. Replace the provision of 2.5.12.2.1 (5)

Loss of Interface link with Fire Alarm System – It should be in fail safe mode.

100. Replace the provision of 2.6.1.8 with following

The system shall comply with the following standards.

- a) EMC emission according to BS EN 55032:2012
- b) EMC immunity according to EN 55103 – 2
- c) Safety According to IEC 60065
- d) All PAS equipment in equipment rooms shall be rack mounted.
- e) All speakers should be EN54-24 or UL Approved.
- f) All Speakers should be complaint to IP 66 rating and installation to be done to protect inside circuitry and cable termination from water and dust ingress.
- g) Speaker to be used in Toilets should be replant to moister.
- h) PA Matrix/Voice Announcers should be EN54-16 or UL Approved/Listed.
- i) All equipment's should be CE Approved.
- j) BS 5839 Part 1 - Fire Detection and Fire Alarm Systems for Buildings. Code of Practice for System Design, Installation, Commissioning and Maintenance.
- k) BS 6259 - Code of Practice for the Design, Planning, Installation, Testing and Maintenance of Sound Systems.
- l) BS EN 54-4 - Fire Detection and Fire Alarm Systems. Power Supply Equipment.
- m) NFPA 130 (Fixed Guide-way Transit System 2010, issued by the US National Fire.
- n) Fire-retardant, low-smoke, halogen-free materials shall conform to the undermentioned specifications:

- o Flame-retardancy: IEC-60332 Part 1 (A) & 3(A) / BS 4066
- o Smoke generation Test: IEC-61034 / ASTM E – 662 or BS 7622
- o Limiting Oxygen Index 35: ASTM D – 2863 / BS ISO 4589
- o Temperature Index 280°C: ASTM D – 2863 / BS ISO 4589
- o Halogen Content /Corrosively/ Toxicity: IEC 60754 Part-1 & 2 / BS 6425

Note: For acid content < 5 mg/g (0.5%) test results as per IEC 60754 Part-1 shall apply and for values< 0.5% test results as per IEC 60754 Part-2 shall apply.

- o. BS 6387: 1994 Categories C, W and Z/ IEC

101. Replace the provision of 2.6.3.7.1with following

A Minimum 100 W Class-D power amplifier shall be provided for each zone at each station.

102. Replace the provision of 2.6.3.7.4 with following

Adequate standby arrangements shall be provided to achieve system availability. At each station 2 Sets of amplifiers each shall be provided, Set 1 shall be in Rack 1 & Set 2 shall be installed at Rack 2. Rack 1 shall feed Even Numbered speakers & Rack 2 Shall feed Odd numbered speaker circuits, Failure of Rack 1 will not affect Rack 2 & hence maintain system availability. Electric Power supply for Rack 1 & rack 2 should be separately Routed with different cable to avoid single point of failure.

103. Replace the provision of 2.6.3.7.5 (1)& (4) with following

(1) RMS power output : 100-500 W RMS as appropriate.

(4) Frequency response : 100 Hz to 20 kHz (-3 dB)

104. Replace the provision of 2.6.3.11.13 & 2.6.3.11.14 with following

2.6.3.11.13 Minimum 6W Ceiling Speaker EN54/UL Approved for Concourse & other False Ceiling Areas or better, discrete tapings shall be provided.

2.6.3.11.14: Minimum 6W Wall Mount Speaker EN54/UL Approved for Service Rooms or better shall be provided in Service areas/rooms for emergency announcements.

Note: Bidder shall submit the specified UL certifications, whenever asked for by Engineer or Employer

105. Replace the provision of 2.6.3.11.15 with following

Minimum 30 W Metal Column Speaker IP65 Rated EN54/UL Approved or better for Platforms waiting rooms, lobbies, ticketing/enquiry areas & Staircases.

106. Replace the provision of 2.6.3.13.1 (b) with following

Deleted

107. Replace the provision of 2.6.6.6.1.1 with following

Fire performance tests of loud speaker cable shall be carried out and shall comply the following as minimum:

- 1) Oxygen index measurement (type and sample test) As per IEC 4589-2.
- 2) Temperature index measurement (type and sample test)
- 3) Flame propagation (type test)
- 4) Corrosive & acid gas emission (type and sample test); as per EN 50267-2-2 (or IEC 60754-2)
- 5) Smoke emission (type and sample test) As per IEC 61034-2

- 6) Fire Resistance Test As per IEC 60331-21 (3 hours at 750oC)

108. Replace the provision of 2.6.7 with following

In addition to the requirements specified in Chapter 12, Appendix D of this TS, following specifications shall be complied for Microphone cables (for cables not having RDSO / TEC specifications)

109. Replace the provision of 2.7.12 with following

Deleted

Chapter 3, PIDS

110. Add following provision under new Para 3.1.1.1 (c)

Reception hall of Metro Bhavan.

111. Replace the provision of 3.1.1.4 with following

The PIDS displays shall comprise:

- a) Platform Visual Information Displays; TFT/ LED Backlit LCD Full HD Panel
- b) Concourse (Paid / Un paid) & Metro Bhavan reception visual Information Displays
TFT/ LED Backlit LCD Full HD Panel

Use of TFT/ LED Backlit LCD Full HD Panel at different locations shall be finalized during detailed design.

112. Replace the provision of 3.1.1.5 (A) with following

The PIDS/PAS server shall be located locally in each station TER and networked to the main PIDS/PAS server located within the OCC TER via the data transmission network. The PIDS/PAS Subsystem will adopt decentralized architecture with redundancy built at both at station and at OCC TER level. System shall be configured such that in event of failure of Central equipment at OCC TER, station will be able to provide all information and functionalities from the local HMI. OR

Bidder may propose Virtualized solution by having all services applications, Database, Management servers including other system applications in Virtualized manner to optimize the solution hardware etc as per bidder design. Virtual Machine solution must not lead to single point of failure and must be design with proper redundancy. Contract to ensure backup server for virtual machines in the network in such a way that all service profiles / data base gets updated automatically with in the network which is getting connected live to the network and work in N:1 redundancy in case of catastrophic failure of the central/Station server. In case of degraded mode all data / software and configuration should be secured and recoverable

from redundant server. Contractor to mention recovery of configuration in the document clearly for review. In case of failure of Subsystem/system redundant software shall be residing in separate server other than primary application server which should work in Hot standby mode

113. Replace the provision of 3.1.1.6 with following

The integrated PAS / PIDS HMI at each station shall be able to monitor and, if required override the information presented on the PIDS Displays and shall provide the SCR operators with the facility to display text messages, monitor system alarms and manage the local display facilities.

Preview functions of the editing messages shall be provided for different display boards via the "What You See Is What You Get (WYSIWYG)" facilities of the HMI.

114. Replace the provision of 3.1.1.9 with following

The display panels shall be based on TFT/ LED Backlit LCD Full HD Panel for Platform, concourse public areas and other locations to be as per latest specifications. It shall provide additional facilities for display of commercial messages / video clips. The Contractor shall submit details of proposed panel for Employer's approval before procurement.

The Contractor shall take due account in the design, site installation and commissioning of the Passenger Information Display System of the distinct stages of bringing the system into operational service.

115. Replace the provision of 3.3.1.2.1(a) with following

A PIDS/PAS central server shall be located in the OCC TER which shall be connected to the PIDS/PAS station server equipment at each station TER via the data transmission system. The PIDS/PAS central server shall have redundant architecture and connectivity to workstation HMIs with mirroring of disks for high reliability. Or Bidder may propose a Virtualized solution by having all services applications, Database, Management servers including other system applications in Virtualized manner to optimize the solution hardware etc as per bidder design. In such case Subsystem/system redundant software shall be residing in separate server other than primary application server which should work in Hot standby mode such that the overall system performance & functionality, RAMS requirement as specified in TS shall be achieved. System shall be designed so that single point of failure does not paralyse the normal operation. Contractor also to ensure that virtual machines should be having real time back up of all data / configurations/ software / service software in such a way that in case of virtual machines are crashed/corrupted, system can be retrieved without any loss of data and reconfiguration of whole system

Contractor may propose integrated servers and HMIs for PAS & PIDS System, Contractor to ensure all functional requirement and RAMS requirement as mentioned in the Technical Specification

116. Replace the provision of 3.3.1.2.2(a) with following

At each station a PAS/PIDS station server shall be located in the TER, which shall operate in conjunction with the central PAS/PIDS servers, the station PAS/PIDS information display equipment and the PAS/PIDS HMI in the SCR for local system monitoring and operator access. OR Bidder may propose a Virtualized solution by having all services applications, Database, Management servers including other system applications in Virtualized manner to optimize the solution hardware etc as per bidder design. In such case Subsystem/system redundant software shall be residing in separate server other than primary application server which should work in Hot standby mode such that the overall system performance & functionality, RAMS requirement as specified in TS shall be achieved. System shall be designed so that single point of failure does not paralyse the normal operation.

Contractor also to ensure that virtual machines should be having back up of all data / configurations/ software / service software in such a way that in case of virtual machines are crashed/corrupted, system can retrieve without any loss of data and reconfiguration of whole system.

Note: Bidder may propose Integrated PAS/PIDS Control Equipment, HMI under PAS or PIDS, however it is the responsibility of N1TL01 contractor to provide seamless integrated system.

117. Replace the provision of 3.3.1.2.5(b)with following

Each platform shall be equipped with a minimum of two double sided TFT/ LED Backlit LCD Full HD Panel. One double- sided TFT/ LED Backlit LCD Full HD Panel shall be mounted at 18 m from the center of the platform (towards the normal stopping point of the train in the concerned direction) and the second double-sided TFT/ LED Backlit LCD Full HD Panel shall be mounted at 18 m towards the rear of the platform from the normal train direction. The cabling lay-out along with enclosures and mounting arrangements shall be designed to facilitate this.

TFT/ LED Backlit LCD Full HD Panel to be housed in IP 66 housing with proper arrangement of power and data cable termination. Housing for TFT/ LED Backlit LCD Full HD Panel to be certified by OEM. Housing must be having side/front openable panels so that each panels can be accessed during the installation & maintenance

Contractor to propose the solution to have integrated displays systems with analogue Clock in the same housing at platform.

118. Replace the provision of 3.3.1.2.6with following

Concourse areas Visual Information Displays

- a) TFT/ LED Backlit LCD Full HD Panel shall be installed within each station concourse for the presentation of the following data:

- i. Train timetable data and information display replicating all of the information on each platform display;
 - ii. General operational service status.
- b) The displays shall be installed in the unpaid side of the gate line, as close as possible to the station entrances and also above or adjacent to, the ticket gate lines.
 - c) Not Used
 - d) Concourse display shall be suspended from the ceiling or wall mounted at a suitable elevation which is comfortable for viewing by all passengers.
 - e) Each display shall be fully visible to a normal sighted individual, when standing or sitting in a wheelchair, at a minimum distance of 25 meters from the display

119. Replace the provision of 3.3.1.2.7(g) with following

The PIDS display housing shall provide cable access from the top or bottom of the unit and shall be equipped with internal cable termination facilities together with an earth terminal for termination of external cables;

120. Replace the provision of 3.3.1.2.12 (c) xiii with following

Message priority conflict, Loss of interface link with Fire Management System
Loss of interface link with CCTV.

121. Replace the provision of 3.4.1.1.4 with following

Indicative quantity of Display Boards to be provided at stations is as under:

- a) 2 nos. double sided per platform
- b) 2 nos. double sided at other areas of station (Concourse).
- c) 4 Nos of single sided at Concourse (paid & unpaid Areas)
- d) 2 nos Single sided at reception of Metro Bhavan

Notes:

- 1) Number of display boards (single / double sided) along with exact location i.e. platform, other public areas, etc. shall comply with all visibility and other requirements and will be submitted by the Contractor for Employer's approval.
- 2) The HMIs for PIDS system will have remote operator access to the PIDS displays of all the stations. The HMI shall have a suitable GUI to select the PIDS display boards in following hierarchy: a) Line b) Station c) PIDS Display screens at OCC.
- 4) It shall also be possible to have individual HMIs for remote operator access to the PIDS displays for use by different controllers.

- 5) All HMI operations shall be tested from OCC and Station Control Rooms (SCR) prior to being brought into operational service.

122. Replace the provision of 3.5.1.4.3 with following

The PIDS shall produce images with a minimum contrast ratio of 4000: 1 when operating in all ambient lighting conditions including artificial lighting and natural lighting, up to full sunlight conditions, which may be found throughout the stations. Luminance should be more than 1000 cd/m². Anti-reflective and darkened front glasses shall be used to optimize contrast value.

Following characteristics to be ensured.

- Minimum size for active area of the PIDS display for concourse and platform shall be 52 inch
- Display Resolution - 1920 x 1080.
- Connector Types (whichever. (applicable) - Serial port, USB, Audio line-in, Audio line-out, Speaker output, Composite video/audio input, VGA input, HDMI.
- Speaker - Build-in speaker/side-mounted speaker (8W or higher) - MSPL 90dB.
- All Cable Entries off communication system shall be sealed and modular based sealing. It should be full proof protection against water & dust ingress, Rodent, pull tension etc

123. Replace the provision of 3.5.1.4.9 (c)with following

Specific locations to achieve optimum viewing distances and viewing angles. As minimum Viewing angle should be of 140 degree or better.

124. Replace the provision of 3.5.1.7.5 with following

During normal operation every message shall be displayed in all the three languages. However, facilities shall be provided for the station and OCC operators to display messages in one language or the other, as the situation demands

125. Replace the provision of 3.6.1.1.18with following

The intensity of illumination shall be such that it is possible to read the information clearly from a distance of minimum 25 meters in day light

126. Replace the provision of 3.6.1.1.20 with following

The Contractor shall provide the following character sets as minimum, but not be limited to, for all kinds of display boards.

- a. Two types of fonts for Marathi and Hindi characters.
- b. Casey (Regular), Lucida Console and Verdana for English characters

127. Replace the provision of 3.6.1.2.1 with following

The PIDS management system shall be equipped with Linux/ WINDOWS based operating system to support the specified management functions. This is contractor's responsibility to commission, test and handover (after DLP) the system with latest Operating system, firm wares and software versions as scope of work.

128. Replace the provision of 3.7.1.5 with following

Maintainability Requirements the Mean Time to Restore, excluding travel time, the PIDS to full normal operation following a failure shall be less than four (4) hours. Contractor shall be required to depute experience staff at site and required to take reasonable accepted time for traveling. However, it shall be ensured that overall availability requirements as specified in this TS is compiled / ensured.

129. Replace the provision of 3.8.1.3.1 with following

Deleted

130. Replace the provision of Annexure A with following

Deleted

Chapter 4, Master Clock system

131. Replace the provision of 4.1.2.1 with following

The Master Clock System shall be compliant with NTP protocol. It will serve as Primary Reference Clock (PRC) for all clock functions of the Metro. The Master Clock shall provide synchronised time signals received by radio communication from orbiting GPS satellites. The Master Clock shall derive Coordinated Universal Time (UTC) from received GPS satellite signals and shall convert this to local Indian Standard Time. The N1TL01 Contract shall provide the Master Clock for Date & Time signal also so that it can act as NTP server for the Master Clock System of NMRCL network.

132. Replace the provision of 4.1.2.2 with following

At OCC, BCC, Master Clock system to be provided under N1TL01 Contract shall consist of following major components

- 1) A GPS Master Clock Unit. (In redundancy)
- 2) Interface to GPS. (In each redundant Unit)
- 3) Sub-master clocks at each of the stations / depot/OCC/BCC/HQ.
- 4) Slave clocks, both digital and analogue at all stations/depot/OCC/BCC/NMRCL HQ
- 5) All power and signal cables, external surge protection devices etc.
- 6) Both primary and secondary fixtures for installation;

In addition of above, MMI shall also be provided at CSS OCC for supervision and maintenance of all stations/depot/OCC clocks provided under N1TL01.

133. Replace the provision of 4.2.3 with following

Display Clocks

- a. Single sided Digital Display Clocks at, Station Control Rooms, OCC, SCR, SSR, DCC, TOM, RSS, small offices & equipment room.
- b. Double sided Analogue Display Clocks – Station Platform & Concourse
- c. Analogue Display Clocks – Large Office Areas, Depot lobby, Depot main workshop
- d. 8 ft Single sided Analogue clock at entrance of station

134. Replace the provision of 4.3.2.1 (5) with following

Deleted

135. Replace the provision of 4.3.3.3 with following

The contractor shall co-ordinate with Civil Works Project Contractors for ensuring aesthetic requirement

136. Replace the provision of 4.5.8 with following

Digital Slave Clocks to be built to Open Protocol DCF-77 or NTP or Time Code and to work on this Open Protocol only. In this reference following points must comply:

- a) Only open protocols are allowed.
- b) Use of the protocol should be free and no limitations should be there for its use by the third party.
- c) At least 2 working references of minimum 12 slave clocks in the last 5 years in each of the works.
- d) Slave clocks from third party shall be able to work this protocol and this should be demonstrated as part of this contract.
- e) Slave Clocks exposed to outdoor, station Platform and Concourse environments shall be designed, manufactured and installed to survive the environment with IP 65 standard and those used in indoor environment (Rooms) with IP54 standard.

137. Replace the provision of 4.6.2.1 with following

The overall Clock system accuracy shall be better than +/- 0.01 seconds per 24 hours. The clock accuracy of the Master Clock Unit shall be better than 1×10^{-5} in free running mode without the input of GPS signal. The Master Clock System shall comply with the NTP Protocol standard.

Master Clock to be equipped with an internal quartz oscillator. This oscillator ensures that the Master Clock accuracy is better than 1 in 10^9 (deviation of $86 \mu\text{s}/24 \text{ h}$) in case of GPS failure

138. Replace the provision of 4.6.3.1.7 with following

The design of the slave clocks shall be of high quality and blend into the architecture of the area in which they are located. Digital slave clocks shall be programmable both for 12 hours and 24 hours. Clocks shall be provided as follows:

1. One wall mounted synchronized digital clock in each Station Control Rooms, OCC, SCR, SSR, DCC, TOM, RSS, small offices & equipment room. The character height of the display shall not be less than 55 mm.
2. Analogue Display Clocks – Large Office Areas, Depot lobby, Depot main workshop
3. One 60 centimeter diameter double faced suspended analogue clock at concourse to the passenger areas to be visible in all lighting conditions;
4. One 60 cm diameter double faced suspended analogue clock in center of each platform at each station.
5. One 8 ft Single faced analogue clock at entrance of station Building. Clock shall be aesthetically suitable for station building. N1TL01 shall coordinate with Civil Contractor to ensure location of clock along with cable containment
6. Display digital clock at various locations shall display 4 characters viz., time in HH:MM format and date in DD:MM format. Analogue Clock shall display hour & minute hands
7. Analogue Clock shall be IP66 & outdoor digital clock shall be IP66 & indoor digital clock shall be IP54.
8. The numbers of clocks are to be worked as per the above requirement.

139. Add new para 4.6.4.2 with following

All software shall be designed to accommodate the ultimate, fully expanded capacity, without requiring any change to the hardware or firmware of the installed system and without affecting the overall operation or performance of the system.

The Clock System shall be modularly expandable without the need to replace the installed hardware and software for the service life of the Clock System

- a) The GPS receiver shall have an expansion capacity of 50% for the addition of Central Master Clock equipment;
- b) The Central Master Clock equipment shall have an expansion capacity of 20% for the addition of Sub-Master Clock equipment and the synchronization modules;
- c) An expansion capacity of 20% by the addition of cards and/or modules;
- d) An expansion capacity of 20% by the addition of racks or cabinets; and
- e) An expansion capacity of 20% by the addition of slave clock units

140. Add new para 4.7.3.2 with following

N1TL01 is responsible for aesthetically accepted installation of cable, fixture and equipment in OCC/Depot and Station Area.

No exposed secondary containment, cable laying is allowed. Colour of primary and secondary fixtures should be in accordance with aesthetics of station / depot / OCC civil structure

141. Replace the provision of Annexure A with following

Provision of Annexure A deleted

Chapter 5, Voice Recording System**142. Replace the provision of 5.1.2.1 with following**

CDRS facility shall be provided in OCC. CDRS Shall provide multichannel voice recording and indexing of direct line communication including communication from all direct line consoles and emergency telephone lines, two-way radio communications, emergency or fire messages broadcast on station PAS initiated from OCC and on train borne PAS initiated from OCC.

CDRS Interface : emergency or fire messages broadcast on station PAS initiated from OCC , Station' SCR and on train borne PAS initiated from OCC. Interface with PA shall be on TCP/IP.

143. Replace the provision of 5.5.1 (1) with following

direct line communication with the direct line consoles at OCC; (the minimum number of channels same as the number of Direct Line Consoles in the OCC , to ensure that all the communication from and to the Consoles in OCC is recorded) Interface between CDRS and the direct line system shall be at Ethernet or Digital port level. The exact interface to be mutually finalized with Telephone contractor.

Voice recording facility to be provided to following also :

- Emergency Telephones
- Help Points
- All calls made for contacting emergency services

144. Replace the provision of 5.5.1 (4) with following

live/emergency broadcast on station PAS initiated from OCC. Also CDRS System is required to record All Telephone-to-PAS announcements

145. Replace the provision of 5.5.16.7 with following

CDRS should be able to record analogue, digital phone analogue Phone extension recording through TCP/IP and E1.

146. Add new para 5.6.1.1.3 with following

The system provides SNMP support (SNMP traps over TCP/IP) for alarms and notifications of its different system components.

CDRS to have interface with following systems also.

- a. **CTFRS:** Recording diagnosis Status, Communication Link Failure Status, System Faults status, Server Failure Status, Security Key Server is down, Server Services is down status.
- b. **Radio:** The interface with the radio system is done through FOTS using TCP/IP connection with the radio Interface server which centralizes all calls established. On TETRA radio voice communications circuits include operational and private calls. Communication of all controllers (between all controllers in DCC, OCC and SCR with other radio users and between all other users) both private and operational. Private calls and operational.

It is preferable to have proven recording system & interface for recordings in similar environment. Replay of Recordings should be encrypted format whereas it should not require

any special/additional software to run. Selection / retrieving of recording should be user configurable.

Chapter 6, TETRA RADIO SYSTEM

147. Replace the provision of 6.1.2.7 with following

The radio system shall be designed to have suitable interfaces for integrating with other related subsystems as specified elsewhere in this TS.

The TETRA radio system including subscriber radios (Portable radios, mobile radios), and Infrastructure equipment (MSO and BTS) preferably should be from a single OEM.

148. Replace the provision of 6.3.1.1 with following

The N1TL01 Bidder must submit their bid based on ETSI Terrestrial Trunked Radio (TETRA) standards and fully compliant with this TS.

The minimum requirement of Radio Base Station locations for the NMRCL is 11. However, any baser Stations, Repeaters, etc required to ensure coverage shall be provided as part of this Contract, without any additional cost to NMRCL by the Contractor as this is a design & build contract. The frequency and coverage planning for the whole NMRCL radio network, shall be Contractors responsibility, but without any additional charge.

The TETRA Central Radio Subsystem shall support and manage a number of Base Stations which shall be at least 20% in excess of the number (to the nearest whole number) required to achieve the functionality and performance as stated herein.

The Radio System working requirement is follows: -

- a) The Bidder shall supply a circuit switch based system or an IP based TETRA Accredited System. The system can have a centralised architecture or a distributed architecture. However, the System Response times as laid down vide Clause no 6.4.3 of this Chapter have to be complied by the Contractors Equipment for the ultimate number of Base Stations (minimum 25) which can be supported by the Central or distributed Radio System Equipment being supplied. In case a distributed architecture is proposed and provided, the Radio Contractor shall be fully responsible for arranging at his own cost any extra networking equipment (routers, switches, etc) required to build his architecture, other than stipulated by the TS from each of the station to the OCC.
- b) All the NMRCL section along with Depot and Yard to be covered from OCC without any blank spot or loss/drop of signal strength.

For NMRCL, the requirement is to provide the Radio System with following strategy-

The installation and commissioning of Train Radios shall be the responsibility of N1TL01. Dispatchers shall be provided at OCC/BCC and at the Depot. The Central System at OCC for the TETRA system should be duplicated so that failure of one system does not paralyses the whole network. The backup system will be installed at BCC.

N1TL01 contractor has to interface with Rolling Stock contractor for implementation of Train Radios, including supply of train radios. The installation and commissioning of train borne radio is the responsibility of N1TL01 contractor. Details of interface requirements for Rolling Stock are at Appendix A1 of TS & details of interface between the CBTC based Train Control System and the telecom system are also explained in Appendix A-3 of TS as guidance to N1TL01 for ensuring in his design of both systems.

For Radio coverage sufficient BDAs, Radio Towers, cables, connectors etc and similarly for On board Train Radio antenna, cab to cab cable are to be used to achieve best performance.

All supplies for radio coverage as per TS requirement at elevated stations are to be provided by N1TL01 contractor and the system to be put into Operation and fully tested for its best performance before bringing in to actual utilization for train services.

149. Replace the provision of 6.3.2.1 (20) with following

System should support, in future if required, end to end encryption as defined by ETSI TETRA Standards

150. Replace the provision of 6.3.3.4 with following

The Contractor shall liaise with all concerned authorities including DoT, WPC, SACFA, civil Aviation authorities and other local authorities and obtain necessary clearances/sanctions for installation and commissioning of the Radio system. All costs therein have to be borne by the Contractor, excluding the cost of Application and the annual frequency usage charges.

The Contractor shall submit to the Employer for inspection, copies of all approval certificates granted by the relevant authorities, including system licenses, dealer licenses, and builder licenses, prior to the final design and installation and prior to the final testing and commissioning as appropriate.

Prior to the design of the Radio network, the Contractor shall assess the traffic load requirements (better than 3% GOS for normal traffic condition) and level of usage of each individual system RF interference and inter-modulation analysis, traffic calculation, number of Radio base stations, as well as related masts or towers required, number of

Radio repeaters, predicted coverage map with Radio signal strength level and traffic capacity, for the approval of the Employer.

151. Replace the provision of 6.4.2.1 with following

The Contractor shall ensure that the Radio system equipment supplied under the Contract comply with the reliability figures herein:

Equipment	MTBF (Hours)
Main Switching equipment	> 1,50,000 hours

Equipment	MTBF (Hours)
TETRA LAN Switch at Main Switching Station	>280,000 hours
Management Server /Zone Server/ /Telephone Interconnect Gateway/Data Base Server >90,000	>90,000 hours
Base Station Radio	> 1,20,000 hours
Radio control panel /Unit	> 1,00 ,000 hours
Radio Dispatcher workstation	>80,000 hours
Train Radio Unit	>1,50,000 hours
Mobile radio equipment in train	> 50,000 hours
Radio control head	> 50,000 hours
Hand portable radio	> 50,000 hours
Hand portable radio Chargers	> 25,000 hours
Radio network management system	> 30,000 hours
Core Router	>1,40,000 hours

Table 4-1 MTBF Figures

152. Add following provision under new Para 6.4.6(vi)

It is desirable to have Inter system Interface for ISI Group Call (or else Mobility Management), ISI Individual call and individually addressed ISI SDS

153. Replace the provision of 6.5.1.6 with following

Contractor to ensure network coverage inside the building (OCC / Depot & Stations) , entire Viaduct , Ramp , Depot arrears , Interchange station building , Platform , concourse commercial space in the station .Parking area , all Lifts , accelerators . Entry/ Exits , Walk ways etc

154. Replace the provision of 6.5.6.15.2.6 with following

The overall solution design has the target of providing the necessary traffic channels for NMRCL's radio users achieving a maximum GOS of 3%; design should meet the traffic loading coming from users of the Nagpur metro radio system.

N1TL01 shall submit Traffic analysis based on the busiest hour traffic estimation and Erlang C model.

Radio system shall support up to 205 subscribers,100% more than Average no. of Users per Base Site. In addition, Traffic calculation in degraded mode shall be required to be submitted for approval

155. Replace the provision of 6.5.7.2 .5.3 with following.

In the RCW screen window, scroll bar shall be displayed with visual and audible alert showing detail of the Train ID, location from which the emergency call was originated. The Controller shall be informed if the call is a non ATP/ATO operation during revenue service. The Controller shall be able to acknowledge the call and then select the calling train to activate two-way communication. If such a call is not answered within a pre- defined number of seconds the call shall be transferred automatically to another designated controller.

RCW Screen shall have touch screen feature so that Operator can handle all features of software & MMI.

156. Replace the provision of 6.6.3.2 with following

A total of 10 (Ten) frequency pairs are envisaged. In case more frequencies are required as per the design of the Contractor, then these have to be arranged by him totally at his cost and without any time implications to the Employer. This cost shall include payment of annual fees also for these additional frequencies upto end of DLP period. The frequencies which may be allotted are in the band 380-400 MHz.

157. Replace the provision of 6.5.10.4.5 & Annexure A with following.

6.6.10.4.5 Radio Base Station

Number of Carrier	Equipped for 2 carriers (TX) minimum (Base Station serving OCC for 4 Carriers (TX))
Frequency Range	380-400 MHZ
RF Carrier Spacing	25 kHz
Mode of Operation	Full Duplex;
Voice and data Duplex Spacing	10 MHZ
Antenna Impedance	50 Ohm
RF Connector Type	50 Ohm
Scalability	16 minimum logical channels per Radio Base Station site (Four channels per Carrier, Full Duplex Operation)
Modulation	Pi/4 DQPSK - Digital Phase Modulation
Gross Bit Rate	1 Carrier 36 kbps
Max. Data Transfer Rate	7.2kbps per slot
Transmission Method	TDMA Channels Per Carrier Four (4)
Speech Codec	ACELP (Gross bit rate 7.2 kbps)
Call Set Up Time	< 300 m seconds
Frequency Tolerance	± 0.1 ppm
Adjacent Channel Power	- 60 dBc
Dynamic Sensitivity	4% BER for TCH 7.2 at -106 dBm (Typical Urban Conditions at 50 kph)
Static Sensitivity	Better than or equal to -115 dBm at 4% BER
Power Supply	Nominal 230 V AC

Annexure A: deleted

Chapter 7, TELEPHONE

158. Add following provision under new Para 7.1.2.2.1 (4)

Staff/ Passenger Help Line at either End of the Platform.: Help Points - mainly for passengers to ask for assistance in platform/ public areas.

Help Point call made be configured as per time bound escalation and can be made transferred automatically from SCR to OCC Chief Controller.in case the call is not answered by Station Controller

159. Replace the provision of 7.1.2.6.1 with following

The Telephone Network Management System (NMS) main at OCC and redundant at BCC with Maintenance Supervisory Console, Keyboard and Log Printer shall be provided by N1TL01 Contractor. Bidder may also propose Virtualized solution by having all services applications, Database, Management servers including other system applications in Virtualized manner to optimize the solution hardware etc as per bidder design. In such case Subsystem/system redundant software shall be residing in separate server other than primary application server which should work in Hot standby mode.

IP PBX, Direct Line Telephone System, IP PBX system and IP Network shall be monitored, supervised and controlled by Network Management Systems.. The N1TL01 Contractor can propose a common NMS for IP PBX, Direct Line Telephone System, IP PBX, IP Network. The number of NMS MMI should be minimum keeping the availability of space in mind.

IP EPABX should be having redundancy with geographical separated places. Redundancy should be provided for Processing, call termination, all generation, Call records and archiving , Alarm Generation etc .

Topology of IP – EPABX to be finalized during the detailed design stage

160. Replace the provision of 7.3.2.3 with following

IP PBX

- (1) Automatic exchange/processor unit with line and trunk interfaces.
- (2) Gateways for interface between the LAN and switched circuit network
- (3) Gatekeeper for admission control functions,
- (4) Network Switches
- (5) Multifunction control console with key pad etc., FAX support equipment
- (6) Power supply equipment, cables, accessories, distribution frames, cabinets, enclosures, racks and earthing etc

161. Replace the provision of 7.5.1.1.2 with following

Deleted

162. Replace the provision under table of 7.5.1.1.9 with following

Network Features

The IP PBX switch network shall provide feature transparency across all the IP PBX switches new and the existing throughout NMRCL. The minimum required network features shall be as given in Table 5-2. Any additional features available in the exchange and not listed in the Table may be indicated, during the Design phase.

No.	Feature	Requirements of the feature
1.	Automatic callback	The Telephone System shall allow internal extension users who have placed a call to a busy internal extension to have the call automatically set up when the busy extension becomes free.
2.	Call forward	The Telephone System shall allow all incoming calls to an extension number to be forwarded or diverted to a selected internal extension. The Telephone System can be defined in three modes: (1) Call forward without exception; (2) Call forward on busy; and (3) Call forward on no reply.
3.	Call park	The Telephone System shall allow a called extension to put call on hold and retrieve new call.
4.	Caller party extension number display	The Telephone System shall display internal call party's extension numbers on the telephones with alphanumeric displays. The display shall operate during telephone ringing.
5.	Call pick-up	The Telephone System shall allow an extension to answer calls made to other extensions within the call pick-up group. The call pick-up group shall be user programmable.
6.	Call transfer	The Telephone System shall allow extensions to transfer internal or external calls to other extensions.
7.	Call waiting	The Telephone System shall notify an extension user, who is engaged on an established call, that another call is waiting to be connected.
8.	Conference call	The Telephone System shall allow an extension on an established call to add additional parties to the call connection.
9.	Direct inward dialing	The Telephone System shall allow calls external to the Telephone System to call an internal extension directly without attendant intervention.
10.	Direct outward dialing	The Telephone System shall allow internal extension users to obtain external network lines directly by keying an appropriate access digit.

No.	Feature	Requirements of the feature
11.	Distinctive ringing	The Telephone System shall provide different ringing tones and cadences for assignment.
12.	Hot-line	The Telephone System shall allow calls to be placed, to a pre-assigned extension group or external network number, when the telephone handset is off-hooked.
13.	Hunting	The Telephone System shall support different modes of hunting to route calls from extensions to idle telephones in a pre-programmed hunt groups. The hunting groups shall be user programmable.
14.	Abbreviated Dialing	Authorised extensions shall be able to dial frequently called extensions by abbreviated numbers.
15.	Access to Paging	Extensions and attendant shall have dial access to a loudspeaker or any other type of voice paging system.
16.	Executive Override	An extension with class of service shall be able to access a busy extension. A warning tone shall be given to the parties.
17.	Attendant Recall	Facility to draw the attention of the exchange operator on an attendant established call
18.	Alternate Route Selection	Primary and secondary routes shall be provided for inter exchange routing with facility of automatic alternate route management over the network.
19.	Forced Release	Measure applicable - User exceeds preset inter digit time interval. Calling user exceeds preset time while listening to ringing or busy tone. When any one of the two users of normal call terminates.
20.	Line lock out	Automatic line lockout if user does not start dialing after a preset time or when there is permanent loop on the line.
21.	Malicious call trace	The Telephone System shall provide functions for user to activate and deactivate a call trace. On activation a printed report of the calling and called parties shall be generated.
22.	Music on hold	The Telephone System shall provide music to a party on hold, waiting in a queue, parked or on an external call that is being transferred.
23.	Recorded announcement	The Telephone System shall provide a pre-recorded announcement to intercept different kinds of incoming calls that cannot be completed.
24.	Voice mail	Voice mail facility to 20% telephone users

No.	Feature	Requirements of the feature
25	Telephone Calls.	
26	Automatic Call Back on Busy Set	
27	Automatic Overflow	
28	Automatic Trunk Call Back	
29	Break In	
30	Redialing – Last Number	
31	Speed Call	

163. Replace the provision of 7.5.1.1.12.1 (7) with following

A minimum of 9 memory keys with 3 keys for speed dialing and 6 keys for programmable system features which shall include but not be limited to, call pickup, call forward, call back, system speed dial, call park, direct pickup, cancel call forward, cancel call back, personal speed dial and one spare key;

164. Replace the provision of 7.5.1.1.12.2 with following

a. Feature of Analog Phone are as under

- Alphanumeric dot-matrix display
- 3 lines + 1 line of icons
- Contrast adjustment
- Volume control for speaker
- Adjustable earpiece volume
- 12 push button keypad
- Function keys for redial, hook flash, mute, phone book, call list
- 10 programmable keys with label identification
- 3 programmable direct access key
- Hands free operation with speaker and microphone
- Ringer/Message waiting led.
- CLI feature for analogue telephones included.

b. Digital Phone Basic Feature:

- Large screen for visibility which also scrolls down;

- Easy to follow layout;
- Intelligent navigation key to easily and quickly access handset settings and functions;
- A qwerty keyboard for the fastest speed dialing and IP transferring possible;
- The ability to see 30+ staff anywhere in the network by scrolling down the screen; Hands free Speakerphone;
- Colour coded easy redial, on hold and transfer functions; Flashing red light to notify of voicemail messages;
- Easy access of up to 3000 system speed dial numbers;
- Mute function

165. Replace the provision of 7.5.1.1.12.3 (9) with following

Dial by name, directory

166. Replace the provision of 7.5.2.1.1 (4) with following

Between RSS/TSS & State Electricity Board Control Room, Security Control Room & Police control room, OCC & Fire Brigade & other civic body for disaster management System through leased telephone line of PSTN (MTNL/BSNL/Private Operator).

167. Replace the provision of 7.5.2.1.3 with following

The Direct Line Telephones shall be single button selection connected to OCC so that an audible alarm is sounded and the location of the calling telephones is displayed on appropriate console at OCC. At the locations other than the OCC, Direct Line Telephones shall be terminated on Digital/IP telephone sets. Consoles shall be provided with single button selection for each direct line connection

168. Add the provision of 7.5.2.2.5 (13) with following

DLT Console shall be touch screen based PC Console

169. Replace the provision of 7.5.3.1.1 with following

The IP PBX Call Management Server, in hot redundant configuration, will be placed at OCC with the redundant part at the BCC and should be configurable in two different subnets. It shall be configured in hot standby configuration such that no single failure should affect the availability of the system. Or Bidder may propose Virtualized solution by having all services applications, Database, Management servers including other system applications in Virtualized manner to optimize the solution hardware etc as per bidder design. In such case Subsystem/system redundant software shall be residing in separate server other than primary application server which should work in Hot standby mode.

IP PBX facility shall be provided at OCC, stations and depot. At OCC, the IP PBX facility shall support 10 voice phones. IP PBX shall provide facility for connecting to other exchange networks. For this, IP PBX shall provide Media Gateway with gatekeeper (1+1 redundant) to support PRI Trunks to connect exchanges in the NMRCL network in feature transparent manner (QSIG in heterogeneous environment). For connectivity to the IP PBX network 4 PRI trunks shall be made available as a minimum.

A NMS for managing the IP PBX, IP network switches will also be provided at OCC. This NMS can be common or separate from the Telephone System NMS.

170. Replace the provision of 7.5.3.1.4 with following

N1TL01 to provision following as minimum, not exhaustive

SN	Description	Elevated	OCC/BCC	Depot
1.	Bandwidth on Ethernet between Station/Depot and OCC.	100 Mbps	-	10Mbps
2.	Bandwidth on Ethernet	-	200 Mbps	-
3.	Call Server	-	1	-
4.	Media Gateway with gatekeeper (1+1 redundant)	-	04 PRI link	-
3.	Voice mail facility	Required	Required	Required
4.	FAX Support	On PC based application	FAX support for 300 users in the network	On PC based application
5.	NMS + Printer	-	As required	-
6.	IP Trunks	-	Based on solution proposed 30 Channels for H.323 Trunks	-

In case Vendor proposes End to End IP Solution to meet technical specifications, then IP ports required shall be estimated and accordingly Layer 2 & 3 switches to be included in FOTS BOQ and submit to NMRCL for review and approval.

For PRI & Bandwidth only fixed onetime cost shall be considered by vendor. Rental shall be paid by NMRCL at actual. However proposed service provider & Rental to be paid shall be got approved from NMRCL.

171. Replace the provision of 7.5.3.1.5.3 with following

Class of Service – E1 Trunk Ring Back Service Tone, The system can be programmed to send a simulated ring back tone to E1 trunks. When the CO does not provide a ring back tone

172. Replace the provision of 7.5.3.1.25 with following

deleted

173. Replace the provision of 7.5.4.6.9.2 with following

The IP PBX shall provide support for Video and Audio phone sets over H323/SIP protocols. The system shall support the following as a minimum

Description	Standard
Call Signaling Protocol	RAS (ITU-T Rec. H.225.0), H.245 SIP : RFC 3261 FAX: T.38
Real Time Protocol, Real Time Control Protocol	RFC 3550, RFC 3551
Device Control Protocol	MGCP/Open Standard
Support for other Protocols	H.325 (up-and-coming standard)
Audio Codes for Voice Compression	G711, G722, G723.1, G729a
Video Codes	H.263/H.263+/H.264
Internet Protocol	QoS support, TOS diffserv, 802.1 P/Q, 802.1AB LLDP

174. Replace the provision of 7.5.4.6.11.1 & Table 5.4 with following

7.5.4.6.11.1

IP PBX Telephones

The IP PBX telephones shall be equipped with, but not be limited to, the following facilities:
Desktop Voice Phone (from OEM of IP PBX)*

- 1) Handset with 12 push-button keypad;
- 2) Adjustable volume control for speaker and ringer
- 3) Monochrome 4 line text display screen
- 4) A minimum of 4 programmable function keys for assignment of features or additional extension circuits and a minimum of 20 memories/phone book for speed dialing;
- 5) Hands-free operation through built-in speaker and microphone;
- 6) Display of call duration;
- 7) System clock display (synchronized);

- 8) On-hook dialing;
- 9) Visual display of details for incoming and outgoing calls;
- 10) (CLIP support
- 11) Support for H.323/SIP
- 12) Two 10/100 BT PC port, POE Type Class ½
- 13) Supporting DHCP Client or static IP address allocation plan
- 14) Inbuilt Lost-packet compensation mechanism, Self-adaptive jitter cache and echo suppression for smooth voice function Voice compression standards G711, G722, G723.1, G729a
- 15) QoS support, TOS diffserv, 802.1p/q
- 16) RTCP and RTP support
- 17) XML support

* In case of phones from manufacturer other than IP PBX, all features of IP PBX switch, Telephone features as per 5.3.1.26 of this chapter, features of UMA as per clause 5.3.1.6 of this chapter and features of NMS shall be available to the users and Non OEM equipments shall not put any limitation during implementation. All liability of support shall equally be applicable on IP Phone providers. Non OEM IP Phones (manufacturer other than OEM of IP PBX) should be reputed and proven.

Table 5.4: deleted

175. Add following provision under new Para 7.6.10

Telephone Matrix: The following type of telephones shall be provided by the Contractor at the following locations

Location	Digital	Analogue	DLT	Helpline
All OCC/BCC, Station & depot Controller	√		√	
Security Controller	√		√	
Office managers	√	√		
Staff rooms		√		
Major Equipment/Plant Room		√		
Metro headquarter	√	√	√	
Power equipment Rooms			√	
Ticket Counters		√		
Customer service centers	√			
Public area				√
Designated waiting area at station				√

Location	Digital	Analogue	DLT	Helpline
All SER & TER		√	√	
Station platform				√
OCC	√	√	√	

176. Annexure A deleted

Chapter 8, CCTV

177. Replace the provision of 8.1.2.3 with following

CCTV Field Equipment shall be installed throughout selected areas within all sites including Stations, RSSs, Depots, OCC. Broadly the CCTV system shall cover the following but not limited to:

- a) Stations: Platforms, Concourses (both Paid & Unpaid), Commercial Areas, Ticket Gates, Gate Lines, Elevators, Escalator Landings, Staircases, Help Points, Entrances, Exits, Sky walks (wherever applicable) , Security Checking Machines, Parking areas, Back of House Rooms/ corridor, Station Control Room, Ticket Office Machine (TOM) Room, Ticket Vending Machine (TVM), Cash Room, Cash Transfer Route, Pump Room, Technical Room Corridor, DG Set, Entry to via-duct and Via - duct (over view), vicinity of station area (entry I exit structures , etc.)
- b) Depots: Operational & Administrative rooms, DCC room, Back of House Rooms/ corridor, Equipment Rooms, Entrances, Exits, Security Checking Machines, Parking areas, Depot boundaries (Perimeter), Train Entry /Exit from main line (via-duct) and/or at grid, Level Crossings, Workshops, Plant rooms, Stabling Lines, Inspection lines, Assembly points.
- c) Operational Control Centre (CCC): Operational & Administrative rooms/ corridors, OCC theatre room, Back of House Rooms/ corridor, Equipment Rooms, Entrances, Exits, Security Checking Machines, Parking areas, Plant rooms.
- d) RSS (Receiving substation) SCADA Room, Control Rooms, Entrances, Exits, Parking areas, RSS boundary (Perimeter).
- e) Long range PTZ/Fixed CCTV cameras with night vision facility shall be provided at the entry/exit of the platforms at every station which would be pointing towards the viaduct covering min. 150 mtrs. on each side of station.
- f) The Contractor shall also provide CCTV cameras in the administrative building in important rooms and premises in the building. The Contractor shall tentatively assume provision of 25 fixed cameras in the building connected to the OCC CCTV server. A separate HMI work station shall be provided at a pre-nominated location for monitoring of all cameras in the Administrative Building. The viewing shall also be possible from the security coordinator room in the OCC.
- g) 10 nos. cameras shall be provided at each parking area/sky ways in P & C area at stations and shall be connected to the associated station CCTV server.

178. Replace the provision of 8.1.2.4 with following

The station (including RSS, Parking & specifically identified theft prone track area) surveillance CCTV system both live and recorded videos shall be accessed simultaneously from the following locations as a minimum

1. At station from Station Control Room & Station Security Control Room
2. At OCC / BCC from OCC controllers & Security Controller (traffic controllers / Chief Controller / Asst Chief Controllers etc) of the concerned OCC / BCC

Failure of one of them shall not affect the monitoring at the others. To improve the performance of the system, items such as workstation (CPU) shall be located only in the TER or CER and the videos to SCR/ SSR/ Controllers are to be extended by using suitable KVM extender without compromising the video quality

179. Replace the provision of 8.1.2.9 with following

Layer – 3 network for Transmission of video from stations, depot & layer 2 field switches are covered as part of FOTS (Chapter 9).

180. Replace the provision of 8.1.2.10 with following

Station entries, parking, RSS, and PF ends shall be covered by providing cameras with IR illuminator at the pole / wall keeping in view the lighting conditions.

Depot perimeter camera shall also be required to provide with IR illuminator for night vision capabilities.

181. Replace the provision of 8.2.2.1 with following

The scope of supply for the IP based CCTV system shall include, but not be limited to the following:

- 1) CCTV control equipment at OCC / BCC, Stations, Depot, RSSs.
- 2) Full HD fixed box type color IP cameras (day/night) with varifocal lens complete with housing and mount
- 3) Full HD fixed Dome type color IP cameras (day/night) complete with housing and mount
- 4) Full HD fixed box type color IP, IR Illuminated (day/night) cameras with vari focal lens complete with housing and mount. for station entry, parking, ramp, and PF ends.
- 5) Full HD PTZ Dome color IP cameras (day/night)
- 6) 360-degree panoramic view cameras
- 7) CCTV MMI consisting of client workstations, monitor, key board, mouse and joy stick for PTZ functionality in SCR, Security control (Police Booths), in stations, Depot Control Room, Security Control Room in Depots and Controllers in OCC and BCC
- 8) Deleted
- 9) Server Based Network Video Recorders for stations, depots and OCC
- 10) Armoured Optical Fibre Cable minimum (12 fibres) to connect the cameras within stations (parking, ramp) depots, RSS to TER. Tentative distance as an average between the RSSs / Ramp / and the stations / depots shall be within 1 km.
- 11) All type of cables as per Appendix D of this TS.

- 12) Deleted
- 13) CCTV Management System at the OCC / BCC
- 14) Supports, Mounting brackets (Primary and Secondary), installation material and accessories for cameras, monitors, field switches, ODF etc.
- 15) Equipment cabinet, racks and cubicles;
- 16) All power supplies / converters, cabling and earthing accessories including termination protection devices;
- 17) Laptops pre-loaded with CCTV system software
- 18) Contract Spares
- 19) 48 port rack mount fiber management system (FMS) in TER for fiber cable splicing.
- 20) Scope of 24 port FMS for field stitches covered under FOTS
- 21) All software and licenses for end to end IP based video surveillance system
- 22) All software and firmware as supplied shall be with license given to NMRCL for lifetime and any upgrades within the currency of contract shall be free of cost.
- 23) Anti-virus and network security software for the CCTV system
- 24) Any other equipment / materials / software as required for completion of N1TL01 contract

182. Replace the provision of 8.3.2.3 with following

The contractor shall ensure that the CCTV system equipment's supplied under the contract shall comply with the reliability figures herein:

CCTV System Equipment	MTBF (Hours) Per unit
Station and Central Equipment	> 50 ,000
IP Fixed Cameras	> 60,000
PTZ Cameras	> 60,000
Video Recording Equipment	> 50,000
Video Display Units (monitors)	> 50,000
Digital CCTV Board	> 50,000

183. Replace the provision of 8.4.1.5 with following

System shall use video signals from various types of indoor / outdoor IP cameras installed at different locations, process them for viewing on workstations / monitors simultaneously at Central Control Room (OCC & BCC) and local control rooms (SCR and at Station Security room) at each station. Network Video Recording system shall provide local recording at the

station itself and mirrored recording (at different location) for all NMRCL stations. Joystick and mouse-keyboard controllers shall be used for Pan, Tilt, Zoom and other functions of desired cameras. The configuration of the cameras, monitors / workstations shall be provided from the OCC, BCC and any other locations simultaneously

184. Replace the provision of 8.4.1.6 with following

The video signal output of all the cameras in various locations at stations, OCC shall be fed to the TER at respective stations / OCC and through Ethernet switch network distribute these video signals to the following:

- Network Video Recorders at the stations / OCC.
- Video Signal for Video Analytics.
- The MMIs at SCR. SSR (station Security Room) (where available) and at the security booth(s) at the relevant station
- The OCC / BCC.

Any other location to be decided by the employer's representative at the time of detailed design.

185. Replace the provision of 8.4.1.8 with following

The video signal output of all the cameras in various locations at the Depot shall be fed to the TER at Depot and through Ethernet switch network distribute these video signals to the following:

- Network video Recorder at the depot
- The OCC / BCC
- MMT at depot controller, security controller
- Any other location to be decided by the employer's representative at the time of detailed design

The CCTV system shall have control equipment's located in the TER at all stations/depot/OCC/BCC. CCTV control equipment for RSSs / ramp shall be installed in the TER of adjacent station/depot.

For RSS, coverage shall be provided to the extent possible by providing on pole or the RSS wall. In case, a pole is required for installing a camera, it will be supplied, erected and installed by N1TL01 Contractor. The Optical Fibre Connectivity for these equipment's to be provided by N1TL01 Contractor for connecting these cameras to the nearest station TER. This equipment's shall be compact and in suitable wall mounting enclosure and shall be installed inside the RSS in a non-air conditioned environment. The AC 230 V commercial supply shall be taken from the RSS and any other type of the supply converted / regulator, if required, to operate the system is to be provided by N1TL01 Contractor.

Some of the cameras in depot, RSS, parking's specifically identified theft prone area etc. are required to be installed outdoor i.e. outside the building with no covering shed. A proper weather proof mounting arrangement complying with IP 66 or better along with wiper

arrangement shall be provided for housing these cameras including any other accessories / equipment required shall also be provided as part of this contract.

186. Replace the provision of 8.4.1.10 with following

The station and depot surveillance CCTV control at equipment's, for connection to the equipment's located in the CERs at the OCC / BCC for remote viewing, recording and control, shall be interfaced through Layer – 3 Switch Network (in the scope of FOTS Chapter9) at every station / depot / OCC / BCC.

There shall be minimum requirement of -6 x 1 gbps optical ports and 16 x 10 /100/ 1000 base T ports available for CCTV system on each layer 3 switch at stations / depot and 24 x 10 / 100 / 1000 base T redundant ports will available as part of FOTS chapter at OCC / BCC for CCTV system. All the cameras in the stations / depot / OCC shall be connected to the layer 2 switches (as part of FOTS) and no cameras will be directly connected to the layer 3 network. Switches to be installed at common location such as TER, Ticketing Office, Station Control Room, Security Room etc.

Contractor shall submit detailed design on port allocation and bandwidth planning to Employer for review and approval.

187. Replace the provision of 8.4.1.11 with following

The list of stations and depot to be provided with Video Surveillance System in NMRCL is given in annexure 1 in Part 2 Chapter 1.

188. Replace the provision of 8.4.2.1 with following

The station CCTV surveillance System shall provide 100% coverage of the following specific areas at all stations as a minimum:

1. All train doors (3 coaches) at the platform
2. Platform operational area and platform ends / tunnel ends.
3. Complete length of all escalators and stairs
4. Concourse area including all the lifts
5. All station entrances and exit (including emergency, fire exit)
6. All automatic fare collection (AFC) gates with facing entry / exit.
7. Exterior of ticket booking offices
8. Exterior of fare adjustment office
9. Parking areas
10. Subways
11. Lifts in OCC, BCC, HQ & Depot
12. 150 mtr of viaduct on either side of station.

The CCTV coverage of the above areas is to be provided by provision of fixed cameras only. PTZ cameras shall not be counted for CCTV coverage calculation.

Complete camera coverage shall be provided to cover the following areas in accordance with the following CCTV system fields of view.

Locations		Camera Field of View		
AREA	Sub – Area	≥10% R	≥ 5% R	≥50%
Operational Rooms	Station Control Room	Yes	N/A	
Platforms	General Platform Area	N/A	Yes	
	Train Entry & Exit End	Yes	N/A	N/A
Ticket Hall & Other Concourses	AFC Gate lines Exit and Entry	N/A	N/A	Yes
	Ticket Offices	Yes	N/A	N/A
	Excess Fares Offices	N/A	Yes	
	TVMs , AVMs	N/A	N/A	Yes
	ATMs (Cashpoint Machines)	N/A	Yes	N/A
	Retail Outlets & Photo Me Booths (if appropriate)	N/A	Yes	N/A
	General Area (if appropriate)	N/A		N/A
Entrances & Exits	Both Sides	Yes	N/A	N/A
Emergency Exits & Route ways	Exits (Both Sides)	N/A	Yes	N/A
	Route ways	N/A	Yes	N/A
	Depot	N/A	Yes	N/A
	Stations	N/A	Yes	N/A
Escalator & Staircase– Full Length		Yes	N/A	N/A
Lifts	Entry /Exit /Interior	Yes	N/A	
Depot	Perimeter fence enclosing the site.	N/A	Yes	
	Vehicular and pedestrian entrance gates	Yes	N/A	
	Train exit and entrance road	N/A	Yes	
	Maintenance Shed		Yes	
Access Control	Important Doors and Access Gates / approaches in back of house areas.	Yes		
Intruder Alarms	Areas Covered by Intruder Detection	N/A	Yes	
Parking		N/A	Yes	

189. Replace the provision of 8.4.2.2 with following

Deleted

190. Replace the provision of 8.4.2.3 with following

The location of the CCTV monitors and control panel shall be as follows:

- 1) One CCTV control MMI shall be provided each for SCR, Station Security Room (SSR), DCC/DSC, Traffic Controller, Chief Controller and for the OCC/BCC Security controller. Please refer to Appendix H MMI Provision schedule for the requirements of MMI
- 2) MMI for SCR and SSR at stations, and security control in OCC/BCC shall consist of work station with two monitors, one key board with joystick controllers and one mouse-keyboard controller.
- 3) MMI for Depot / security controllers in the depot and traffic controllers / chief traffic controllers in OCC / BCC shall consist of work stations with one monitor and key board with joystick controllers. Mouse, keyboard controller.
- 4) N1TL01 shall make interface with Signaling contractor to make interface between CCTV and Video Wall compatible. Detailed Interface Document shall be submitted for review.
- 5) The input to projection module of Video Wall will be DVI-D to have a flicker free image on the Large Screen Graphics Wall. Other Input ports - HDMI, Analog RGBHV and Display port for multiple inputs connectivity. N1TL01 shall interface with Signalling Contractor to design and implement all Video wall interfaces.

191. Replace the provision of 8.4.2.5 with following CCTV Standards

The TV standard to be employed shall be ITU-T, PAL, 30 frames per second with progressive scan.

Advanced video compression techniques, such as MPEG – 4 and H 264 as minimum, shall be employed to minimize transmission bandwidth and recorder storage capacity without compromising the subjective quality of the displayed video images.

The frame rate and resolution of the video signals shall be a programmable feature which shall be optimized to reflect the nature of the image types (such a slow motion to very high motion video) being displayed and recorded.

Frame rates shall be variable but not limited from 1 to 30 frames per second and resolution values shall be fully selectable to include at least 4CIF, HD and Full HD. The ability to select the frame rate (1 to 30 fps) and resolution (4CIF, HD and Full HD) will apply to monitoring as well as recording.

Where cameras with Video Motion Detection are used as part of the Intruder Detection System, very high quality video images are required employing minimal compression.

192. Replace the provision of 8.4.3.2 with following

Deleted

193. Replace the provision of 8.4.3.3 with following

The video signals of these CCTV cameras monitoring the platform and train shall be available to the following equipment simultaneously at all stations:

1. Deleted

2. OCC/BCC traffic controller, Asst. Chief Controller and Chief Controller
3. OCC/BCC Security Controller
4. SCR and Station Security Rooms(s) for surveillance of that station
5. NVR for Recording.
6. Video Analytics Servers.

194. Replace the provision of 8.4.3.5 with following

Deleted

195. Replace the provision of 8.4.5.1 with following

All status of the CCTV system equipment including CCTV cameras, video recorders, and approved by the employer's representative shall be monitored by CCTV Management System / NMS in the CER at the OCC / BCC and shall automatically generate an audio / visual alarm on the CCTV Management System.

Incident management system with list of SOPS related to maintenance/ operation /emergency should be executed by operator in OCC. Also Incident Management System should be capable of sending SMS & Email send to concern responders.

196. Replace the provision of 8.5.1.6 with following

The CCTV Central Management System in OCC / BCC shall be installed on servers within a cluster of 2 servers or more. In case a server in the cluster fails, another server in the cluster shall automatically take over the failed server's job running the management system. or Bidder may propose Virtualized solution by having redundancy to all service applications, alarm management, Database, Management servers including other system applications in Virtualized manner to optimize the solution hardware etc whereas Contractor to design virtual network on physical hardware in such a way that system is capable of capturing live back of the system in Backup server (Physical in N:1 redundancy), in case of fail over mode all services , alarm management , control management should be transferred to redundant server without any delay and operational interruption..

In such case Subsystem/system redundant software shall be residing in separate server other than primary application server which should work in Hot standby mode.

Virtualization of database and recording logs are not allowed.

197. Replace the provision of 8.5.1.8 with following

The CCTV system shall afford viewing simultaneously at the SCR, Security Room at the station. Depot Control Centre / Depot Security Control at the depot, incidence management Room, Metro House and from the OCC / BCC at full frame rate Frame rates shall be variable from 1 to 25 frames per second and resolution values shall be fully selectable to include CIF and 4CIF or better. The ability to select the frame rate (1 to 25 fps) and resolution (CIF & 4 CIF or better) will apply to monitoring as well as recording. The viewing shall be variable at

4CIF 25 fps or better. Camera recording resolution shall be at Full HD. The normal full HD 25 fps shall determine the size of the storage device. The storage capacity shall be calculated keeping in view the spare capacity of 25% of the installed capacity. The primary recording shall be at the station TER and the recording shall also be mirrored at the adjoining station at the same frame rate and resolution.

198. Replace the provision of 8.5.1.9 with following

Deleted

199. Replace the provision of 8.5.2.1.4 with following

Unless specified otherwise elsewhere in the TS, field switches and other equipment meant for outdoor installation, shall be suitable to work from 0 to +55-degree C with RH up to 80% non-condensing.

200. Add new para 8.5.2.1.6 with following

CCTV Camera View Requirements

- a. Three categories of views shall be employed as defined below:
 - i. Detection - not less than 10% R. Following an alert an observer is able, after a search, to ascertain with a high degree of certainty whether or not a person is visible in the pictures displayed.
 - ii. Recognition - not less than 50% R. A viewer is able to state with a high degree of certainty whether or not the individual shown is the same as someone they have seen before.
 - iii. Monitoring- not less than 5%. This is applicable to general Monitoring/surveillance applications in areas frequented by the public/barred to the public.
- b. The categories shall be measured by relating the views to the image height of a standard test target 1.6 m high.
- c. When the image of the target fills the screen vertically the image height is equivalent to 100% R, where "R" is the abbreviation of 'Rotakin', defined as UK Police Scientific Development Branch's test target.
- d. Fixed Camera Should be having optical zoom up to 4X as minimum.

N1TL01 to submit detailed coverage drawing for approval. Simulation study for CCTV Coverage shall be submitted for approval which will show area wise coverage as per 50% , 10 % and 5 % arc for approval

201. Add new para 8.5.2.1.7 with following

Focal Length shall be minimum. Lens 9-40 mm or better. Vendor to indicate the focal length range for both wide & Telephoto dynamic range, Particular lens and allocation as per coverage area shall be finalize in detailed design stage

PAN Tilt Adjustment as minimum:

- a) For Fixed Camera - Manual Pan / Tilt adjustment upto 340 / 180 Deg .
- b) For PTZ Cameras - 360 Deg continuous Pan and 180 Deg tilt with auto flip.

Pan and tilt units, fitted with the camera and associated equipment, shall meet the following minimum performance:

- a) Pan Rotation: 0⁰ to 360⁰
- b) Tilt Rotation: -90⁰ to + 90⁰
- c) Pan Speed: 90⁰/Sec.
- d) Tilt Speed: 90⁰/Sec

Bandwidth : 64 Kbps – 8 Mbps;

Camera Inputs minimum - 2 potential free dry inputs, Outputs - 1 NO/NC changeover contact

202. Replace the provision of 8.5.2.3.4 with following

The Housing shall either be integrated with the camera by the manufacturer or it shall be of same make as the camera or one of the reputed makes.

203. Replace the provision of 8.5.2.3.5 with following

The camera shall work on 220 V AC voltage or 24 V AC or 12 V DC or 24 V DC, or POE as required as per the design and implementation.

204. Replace the provision of 8.5.2.4.1 with following

Mounts shall be suitable for indoor and outdoor mounting units designed for fixed cameras or camera housing installations. The mount shall be of the same make as housing.

Mounting height to be ascertain during the detailed design phase. Contractor to ensure height of the camera minimum 2.5 m from FFL.

205. Replace the provision of 8.5.2.5 (C) & (E) with following

- (C) Sensitivity: @ F1.2, 30 IRE or better
- Colour Mode: 0.35 Lux or better
- Night Mode (Black & White): 0.08 lux or better

(E) Video Resolution: Minimum 4 Mega pixels, it shall be possible to configure camera in lower resolution.

206. Replace the provision of 8.5.2.5(Y) with following

Deleted

207. Replace the provision of 8.5.2.6 (3) & (5) with following

- (3) Sensitivity: @ F1.2, 30 IRE or better

Colour Mode: 0.35 Lux or better
Night Mode (Black & White): 0.05 lux or better

(5) Video Resolution: Minimum 4 Mega pixels, it shall be possible to configure camera in lower resolution.

208. Replace the provision of 8.5.2.6 (8) with following

IP66 or NEMA-4 or better

209. Replace the provision of 8.5.2.6 (26) with following

Deleted

210. Replace the provision of 8.5.2.7(E) with following

Video Resolution: Minimum 4 Mega pixels, it shall be possible to configure camera in lower resolution

211. Replace the provision of 8.5.2.7(FF) with following

Deleted

212. Replace the provision of 8.5.2.8(23) with following

Deleted

213. Replace the provision of 8.5.2.9 with following

Provision & spec for switch covered under chapter 9 FOTS. Ethernet output from the IP cameras (Fixed and PTZ) shall be directly connected to the field switch through data cable and suitable protection devices. The outputs of the field switch shall be connected to the two aggregate switches by using 2 x 1 Gigabit Fibre Uplinks through separate optical fibre cable to the redundant ports available in TER switches.

For powering the PTZ, if the power (PoE) available on the field switch ports is not sufficient to drive the PTZ functionalities, a separate power cable shall be laid by N1TL01 contractor.

214. Replace the provision of 8.5.2.11 (5) with following

Joystick (keyboard) should support RS 232 / RS 485 connectivity and Ethernet connections and should be supplied with required interface units.

215. Replace the provision of 8.5.2.12 with following

Processor: At least Intel Xeon Processor E3-1275 V3 (8 MB Cache, 3.5 GHz) for the Directory machines or better

216. Replace the provision of 8.5.2.12 (7) with following

Hard drive: 2 x 120 GB SSD RAID-1 configuration or better

217. Replace the provision of 8.5.2.14.1 (1) with following

At least Intel Xeon Processor E3-1275 V3 (8 MB Cache, 3.5 GHz) for the Directory machines

218. Replace the provision of 8.5.2.14.1 (3) (4) & (8) with following

(3) Memory: 120 GB scalable to 300 GB DDR 3 Registered Low Voltage DIMMS,1333 MHz or better

(4) OS Hard Drive: 2 x 120 GB SSD RAID-1 configuration or better

(8) Network Controller: Dual Intel i210AT Gigabit LAN

219. Add the provision under new para 8.5.2.14.1 (13)

Contractor is responsible for seamless integration of NVR recorder network with CCTV services and functionality.

NVR hardware and software shall be from same OEM with tested and proven credentials. if it is from different OEM, proposed solution should have been implemented at least at 2 project & in revenue operation

220. Replace the provision of 8.5.2.17.2 with following

Intelligent Video Analytics shall be implemented on the proposed cameras. Different types of Video analytics feature shall include but not limited to:

- Intrusion detection,
- Unattended baggage detection,
- crowd estimation and crowd management alarms for platforms,
- line control,
- counter flow detection overcrowding detection,
- camera tampering alerts

The Video Analytics functionality shall have mechanisms to continue alarm generation in case of failure of the Server. The Video Analytics shall not be bound to the MAC address of the device and hence any video analytics feature shall be possible to be deployed on any camera. The Video Analytics system shall also have functionality to help tracing the person who left baggage unattended.

221. Replace the provision of 8.5.2.17.7 with following

Rule Based Detection: The video management system shall support solution that makes it possible to integrate video content applications seamlessly into viewing client environments to trigger alarms.

Minimum of 16 cameras of each station, 4 cameras of depot, 16 cameras of OCC shall be provided with Video Analytic functions. The distribution of the total Analytics to the various cameras at the relevant locations shall be developed during detailed design.

222. Replace the provision of 8.5.2.18.1 T with following

The system shall support multicasting of video feeds to client workstations in order to conserve network resources. Multicasting shall send a single stream of video to multiple clients, where the stream may be decoded and displayed on all clients simultaneously.

223. Replace the provision of 8.5.2.18.3 P with following

Minimum recording shall be for 30 days

224. Add following provision under new Para 8.5.2.18.10

Monitoring On Board CCTV: The Contractor shall enable the monitoring of the on board Rolling Stock CCTV system. A minimum of two video streams from each Rolling Stock NVR shall be available for real-time monitoring.

The video signals shall be available to the following equipment simultaneously:

- OCC/BCC Traffic Controller and Chief Controller if the camera is selected by either of them from their CCTV HMI;
- OCC/BCC Security Controller.
- Also PEA Cameras inside rolling stock i.e in case of emergency passenger should be able to press emergency alarm and necessary alert should pop up in control room
- Cameras inside train coaches should be able to send alert to main control room in case of emergency

225. Add following provision under new Para 8.5.2.18.11

Incident Management System shall have following features

- It shall provide a unified viewing and management GUI that enables operators to manage situations in exactly the same way, regardless of underlying integrated systems.
- It shall process events automatically, perform correlations, prioritization and rule based calculations according to a flexible predefined business logic as well as facilitate the management of situations as opposed to individual alarms.
- It shall have applications to support the complete operational cycle of Planning, Responding and Debriefing. It shall be capable of running on a single or multi-screen environment, as desired by the customer. In multi-screen, all application panes will be capable of being docked or undocked and be sent to specific screens.

- It shall support the planning and activation of dynamically adapting response plans according to real time varying situations.
- It shall have a dedicated Incident Log screen intuitively providing situation decision guidance support.
- It shall have the following Incident creation options: automatically as a result of pre-configured rules, on demand by operators or from scheduled triggers.
- It shall have the ability to open incidents on demand via pre-configured action buttons and keyboard function keys.
- It shall provide the ability to add incident comments, in either a predefined form format or free text format, and task comments.
- It shall display an indication of an overall situation threat level (also referred to as Security Alert Level). The threat level indicator shall be visible at all time and shall have several levels with different colors.
- Authorized users shall be able to change the threat level on demand.
- Administrators shall be able to configure threat level changes as actions triggered by various predefined events or as a result of predefined events.
- Administrators shall be able to predefine threat level change triggers such as – ‘level raised/reduced to high’ for example. Administrators shall be able to define various actions to take place upon triggering threat level events. An example may be deploying a threat level increase procedure whenever the level is raised to a certain level.
- It shall provide a visual environment to design business workflow processes that map business rules into a set of workflows to provide automatic responses
- It shall include conditional branching steps, parallel activities, actions, listener steps, timers, If-Then-Else steps, Workflow termination steps, etc.
- It shall have tools to facilitate and automate routine operations. These are activities that are performed by the operation on a regular or semi-regular basis.
- It shall support the simulation of events, such as triggering a non-real alarm for training purposes.
- Simulation feature shall require special permissions.
- It shall support the automatic triggering of simulated events on a predefined schedule.
- It shall allow the incorporation of video movies to be used instead of real camera live video for training purposes. All simulated events and responses shall be stored in the system database and be available for post-training debriefing and lesson learning sessions.
- It shall be designed and built to allow smooth and fast integration with all control room systems, sensors and edge-devices.
- External systems interfaces shall be available separately from the core product, come with their own installers and not require any modification to core product version.
- In addition when an emergency call is made by a radio hand portable device an alarm must be sent to the OCC and SCR with the location information of the hand portable device and the CCTV consoles there must automatically display the associated camera viewing the incident.

226. **Add new clause 8.6.6 with following**

The CCTV System has interfaces to the following telecommunications systems:

Access Control and Intrusion Detection System (ACIDS).
Telephone System (Help Point).

Fault Reporting system (FRS).
Master Clock System.

227. Replace the provision of Annexure A, B & C with following

Deleted

Chapter 9 FOTS

228. Replace the provision of 9.1.1.9 with following

A Network Management System shall be provided at the OCC and BCC to monitor status of all the FOTS equipment and control the operation and maintenance process. It shall provide alarm surveillance, performance monitoring, configuration management, failure management as a minimum as per operational requirements.

229. Replace the provision of 9.1.1.14 with following

The FOTS shall conform to the applicable ITU-T and IEEE standards and shall fulfil the EMC standards EN 55022 class A

230. Replace the provision of 9.1.1.18 with following

Deleted

231. Replace the provision of 9.1.2.1 with following

Scope of Supply: The Scope of Supply shall include all FOTS Network Equipment, software and manuals for the following:

- a) Carrier grade L2 / L3 switches/routers inside TER/CER & Enterprise grade switch outside TER/CER
- b) Network Management System
- c) Single Mode Optical Fibre Cables, connectors and ODF/patch panels for back bone
- d) SFP modules - LH and SH
- e) Multi Mode Optical Fibre Cables, connectors and ODF for LANs
- f) Splice Boxes and Remake Loops
- g) Distribution Frames
- h) Terminating and interconnecting equipment including Termination Protection Devices, SM optical patch cords, MM optical patch cords and CAT6 patch cords
- i) Equipment cabinets, racks and cubicles
- j) All required connectors
- k) All Installation materials
- l) Power Supplies and Distribution Boards, cables, Earthing and Accessories including Termination Protection Devices
- m) Spares in accordance with the stipulations in this TS.
- n) Expansion capacity per TS

- o) LAN wiring between the local TER and approx 15 rooms of OCC/BCC, complete depots, & complete stations for OA/IT.
- p) Network equipment to provide LAN connectivity for OA/IT.
- q) hardware firewalls for internet service for OA/IT.
- r) Base Frame, under floor trays and tray risers in TER.
- s) Special Tools and Test Equipment as per TS.

232. Replace the provision of 9.1.3.1.4 with following

Depending on the subsystems connection performances requested (bandwidth, level of service, type of data, network interface,) and on the different intrinsic solutions, the following FOTS solution is proposed:

Table 5.1: Details of FOTS for other systems

Item	Subsystem	FOTS Solution
1	Telephone subsystem	GE
2	Train Radio subsystem	GE
3	Closed Circuit Television system	GE
4	Master Clock subsystem	GE
5	Public Address subsystem	GE
6	Passenger Information Display Subsystem	GE
7	Access Control and Intrusion Detection Subsystem	GE
8	Fault Reporting Subsystem	GE
9	OA / IT Systems	Dark Fibre
10	Building Management System	GE
11	Automatic Fare Collection	GE
12	Power SCADA	GE

233. Replace the provision of 9.1.3.1.6 with following

GE IP backbone rings, of 10 Gbps, shall be formed using multilayer ring structure in the network to support all Telecom Subsystems and non-telecom systems requiring transport. The transmission system shall be formed in the network to support all low band width applications i.e. TETRA Radio, PAS, PIDS, Clock, CDRS, AFC, BMS, SCADA, ACIDS and Telephone System etc. along with high bandwidth application i.e., CCTV system. The Contractor shall submit the proposed network diagram for implementation of the back bone network for approval of the Employer

234. Replace the provision of 9.1.3.4.4.

The Contractor shall propose a Fibre cable that supports the specific metro railway constraints, and shall determine the exact total number of fibers needed and reserve at least 30% of fibers, within each cable, as spares for future use. Nevertheless, as a minimum two 144 Fibre cables (one on UP track and one on DN Track) shall be proposed, each terminated between station TERs, OCC and depot TERs. Connectivity of the RSS's will be done using separate Fiber cables of minimum 24 fibers. Intra connectivity of station, depots & OCC location for CCTV, PIDS etc. shall be done by 12 Core Armored SM / MM fiber for FOTS

235. Replace the provision of 9.1.3.4.11 with following

Armored (Corrugated Tape) OFC in viaduct, depot and other open areas will be Provided / housed in UV resistant HDPE duct. Which run in the exposed areas or where directly buried in ground shall be contained in protective conduits and shall be as approved by Employer? Laying of fibers shall conform to the manufacturer's recommendation concerning the mechanical constraints, such as the minimum bending radius.

Armoured OFC Cable to be used for indoor purpose also. Optical Patch Cords running inside the racks shall be housed in LSZH PVC flexible.

236. Replace the provision of 9.1.4.1.5 with following

The Access Switches proposed for various sub systems including outdoor / rugged Enterprise Gigabit switches should support Ring resiliency based on Open standards and must ensure seamless interoperability with the FOTS WAN system to adopt a flexible Ring architecture between the Station level Distribution and various Access switches with in the station, Depots, OCC, BCC and other locations of NMRCL.

Ethernet network should comply for following as minimum:

- QinQ configuration of VLANs.
- Multicast protocols
- PIM Protocols
- MVR Protocols
- MLAG
- IPV4 MCast
- EAPS
- LCAP
- VRRP
- SNMP
- Delay and Loss measurements.
- CFM Measurements,
- CLI Configuration
- ACL protocols
- Protection against single point of failure.
- Protection against catastrophic failure.

237. Replace the provision of 9.1.6.3.3 with following

The availability of any circuit within FOTS shall be better than 99.999% assuming minimum acceptable travel time.

Availability shall be inclusive of hardware and software.

238. Replace the provision of 9.1.6.3.4 with following

The Network Management System shall be considered unavailable if any functions provided by the Network Management System cannot be properly exercised. The availability of the Network Management System shall be better than 99.6% assuming minimum acceptable travel time

239. Replace the provision of 9.1.7.3 with following

The service life of the FOTS equipments except server/workstation shall not be less than 10 years. The service life of all types of cables shall not be less than 25 years. **The service life of Server/Work Station shall not be less than 10 years**

240. Replace the provision of 9.1.8.2 with following

The absolute group delay at the frequency of minimum group delay shall not exceed 50 milli seconds taking into account of the worst delay scenarios.

241. Replace the provision of 9.1.11. 1with following

The FOTS Network Management system and the network elements shall provide operation, administration, maintenance & provisioning (OAM&P) functions in accordance with the LAN/WAN Management Network.

242. Replace the provision of 9.2.1with following

Redundant Layer-3 switches at each station, depot & OCC/BCC shall be provided as a minimum as part of this Contract. However, to meet the requirement of this Contract and Designated Project Contractors, additional equipment if required shall also be provided by N1TL01 Contractor within the currency of this contract. No additional Cost to meet with the requirement of other project contractors will be given.

The Core switch at OCC/BCC shall be chassis based and shall have redundant critical modules like supervisor/control/management card & power supply card etc.

The WAN switches should be equipped for the interfaces given below as a minimum:

S No.	Interface	Core switch	Stations/depot Layer-3 switches
-------	-----------	-------------	---------------------------------

1	40G optical uplink interface	2	Nil
2.	10G optical uplink interface	10	2
3.	1G optical uplink interface	8	4
4	10/100/1000 Base T port	48	20

243. Add new para 9.3 OA & IT

9.3 OFFICE AUTOMATION AND INFORMATION TECHNOLOGY

9.3.1 General: The Office Automation (OA) and IT System shall provide the network infrastructure for the operators and other administration/maintenance staff to handle office administrative works. All the administrative works shall be carried out on this network. This network shall be distinct from the communication network provided for the train operations.

9.3.2 Scope of Work

9.3.2.1 Provision of separate Layer 2 & layer 3 switch at station, RSS & depot for OA& IT network, Provision of Core switch for OA&IT inclusive is in the scope of IT Contract. GE IP backbone rings, of 10 Gbps, shall be formed using multilayer ring structure in the network to support OA&IT. Contractor need to interface with IT Contractor and IT Network through fire wall for integration of NMS & switches.

9.3.2.2 local LAN and the connectivity of this network on the OFC backbone between OCC, stations, DCCs and other operational administrative offices

9.3.2.3 Networking hardware for the OA and IT system. The scope of Communication Contractor shall be provision of OA/IT System (including design, supply, installation, testing, commissioning and integration). All personal computers, printers and servers for data storage and related application software are not included in scope of the communication Contractor N01TL01

9.3.2.4 The communication Contractor shall provide the local LAN and the connectivity of this network on the OFC backbone between Metro House ,OCC, stations, DCCs and other operational administrative offices at Stations and other location of NMRCL.

9.3.2.5 N1TL01 is responsible for laying secondary containment for O&IT Network . Contractor to coordinate with civil contractor to get allocation for space to lay conduits, cable trays , under floor cable containments .

9.3.2.6 All cables to be concealed and exposed cabling is not allowed.

9.3.2.7 N1TL01 is responsible for all data cable & power cable testing prior to commissioning and post commissioning work .

9.3.2.8 All wall mounted Data Port to be position aesthetically suitable for the building / location.

9.3.2.8 N1TL01 is responsible for supply of wall mounted 4 ways / 6 ways junction box , cover plates , RJ 11/45 sockets plates and material required for installation and termination.

9.3.3 System Description

- 9.3.3.1** All the OA & IT servers, OA/IT PCs and printers. (Not in scope of OA / IT vendor) required for administration works of the Rail System shall be connected on the dedicated OA / IT GE network.
- 9.3.3.2** The network shall connect the administrative head quarter office at Metro bhavan with the stations, Depots, OCC and offices located in the NMRC.
- 9.3.3.3** The OA / IT network shall be extended to all locations / rooms in stations, OCC, DCC and provided with voice network. OA&IT Network shall have separate CORE / Distribution/ and access layer. The contractor to ensure system fall back redundancy and to ensure that there should not be any single point of failure. The Contractor shall provide minimum one 24- port switch at each station, 10 Nos. 48-port for OCC & Admin and 2 nos. 48 port switch at each depot (all L-3 Switches with 10/100/1000mbps ports) for OA/IT network. Specifications of the switch shall be as provided in the FOTS specification. A separate NMS for OA/IT with all hardware and software shall also be supplied.
- 9.3.3.4** Details of locations of OA / IT terminations will be coordinated with the EPABX extensions and a final list of OA / IT extensions shall be submitted for approval of the Employer.
- 9.3.3.5** CAT 6E, STP data cables with flame retardant and LSLH properties combo termination point for telephone & data (RJ 45) connectivity shall be provided at every location including end-point socket. The CAT 6E STP cable shall be terminated in the combo termination point.
- 9.3.3.6** All requirements pertaining to cabling & termination mentioned in this specification shall also be applicable for this chapter.
- 9.3.3.7** N1TL01 is required to interface with NMRCL IT Network through firewall.
- 9.3.4 Spare & Expansion capacity:** In addition to provisions the OA / IT network shall have as spare capacity to accommodate additional ports to tune of 20 %. In addition, OA/IT network system shall support expansion capacity to the tune of 20%.
- 9.3.5 Reliability & Availability**
- 9.3.5.1** Availability of the OA / IT network shall be better than 99.995 %.
- 9.3.5.2** MTTR for the OA / IT network shall be less than 1 (one) hour (All Inclusive). Notwithstanding the MTTR, the contractor shall ensure that the availability parameters are met.
- 9.3.6 OA&IT Equipment.**
- 9.3.6.1** OA&IT equipment specification and make shall be of same make and specification as of FOTS.
- 9.3.6.2** N1TL01 shall submit detailed design of OA&IT with link budgeting, port allocation, bandwidth details, and RAMS calculation to the employer for review.

Chapter 10 ACIDS

244. Replace the provision of 10.1.2.1 b with following

Where doors are controlled by a smart card reader, an additional override key switch shall be provided as an alternative means of access.

The station key to be installed at the walls outside the stations and buildings close to the entry/exit accesses, and triggers an alarm signal when it is pulled out of the wall, or when it is destroyed.

245. Replace the provision of 10.1.3.2 i with following

System functionality shall be achieved with central server in redundant mode. Contractor shall submit design & RAMs calculation for final approval.

246. Replace the provision of 10.1.3.2 vii with following

Enclosures for smart card readers, override key-switches, egress equipment and power supply equipment. All access point facilities shall be vandal resistant and tamper proof. Access point controller and Battery shall be properly housed in an enclosure having IP rating of IP 66. Contractor to ensure aesthetics view of the station /OCC/ depot area where ACID system will be delayed. Exposed cabling, conduiting, cable containment is not allowed. Contractor to interface with civil works contractor to ensure timely deployment of secondary containment so that cable laying can be done. Door equipment like I/O box, battery Boxes, CPUs shall not be exposed. This equipment to be installed above false ceiling or below false floor to ensure easily maintenance.

247. Add additional para 10.1.3.2 xiii

Magnetic Locks based access control system which requires minimum grooving in the room door's frame /door

248. Add additional para 10.1.4.6 f

If an intrusion is detected by the ACIDS, an alarm is triggered in the HMI position (ACIDS - interface) and a Pop up is automatically displayed. This will allow the CCTV operator to start tracking the intruder.

This is possible to configure alarm / pop up tp get displayed locally (SCR –HMI) or centrally at OCC CER.

249. Add additional para 10.1.4.6 g

At Service gate at platforms access point reader shall be positioned at the common location, and shall be accessible from both the entry and exit side. Further at each Wicket gate / service gate it is required to have exit button installed on Via Duct side. All equipment, cabling installed at edge of the platform should be complying to IP 66 and of outdoor type

250. Replace the provision of 10.1.4.11 with following

The employee master data base of NMRCL shall be synchronized on line with the ACIDS system data base for authentication.

It is possible to synchronize both databases ACIDS and Nagpur Metro Rail Corporation. In order to ensure a correct synchronization between two databases, a bi-directional

synchronization process is needed. The ACIDS database will go receive all relevant information about the NMRCL employees, and in opposite direction, the NMRCL receives the time attendance of its employees. The time attendance data that are synchronized with NMRCL database are only the data/time of entrance and exit of the employee. All process about ACIDS and NMRCL databases synchronization will have be discussed in detail, as part of the interface design with NMRC and AFC Contractor. Interface is in scope of N1TL01.

Contractor shall be responsible for employee data base creation and update till DLP/ Handing over the system.

Contractor shall be making provisioning in bio matric reader so that same can be used as attendance system by NMRCL.

251. Replace the provision of 10.1.5.2 with following

Deleted

252. Replace the provision of 10.1.5.4.2 (a) with following.

Operate in conjunction with central server. Central Server shall be provided in OCC & BCC along with NMS. OCC server's HMI clients can be provided at station level for local operation. N1TL01 to submit design for approval which shall comply with functional and RAMS requirement.

253. Add Additional Clause.10.1.5.4.2 (d) with provision as under

Access controller operating Temperature to be 0 to 70°C for non-air conditioning working & in harsh environment in case of fire etc. Access controller should have multiple inputs & multiple outputs fully programmable for taking care of intrusion & alarm point near the access door. In case main access controller fails then sub access controller should work in standalone mode. Redundant communication port for more reliability dual IP on board shall be provided. Access point Controller should be POE & POE+ enabled capable of battery charging, powering up readers etc.

254. Replace the provision of 10.1.9.7 with following

The Access Control & Intrusion Detection System equipment shall be installed at the site locations stated below

Corridors	Stations/ Sites (Nos.)	OCC Central Server	Access Control	Intrusion Detection	Local Operation Via HMI (integrated with CCTV HMI)	Operation via HMI in OCC
Corridor 1 Corridor 2	19 nos. 17 nos.	Networked	Yes	-	Station Control Room	Yes in SCR
Receiving Sub- stations	1 nos. (tentative)	N/A	Yes	Around Building / perimeter Entrances	Station Control Room (nominated)	Yes
OCC	1 no.	Yes in CER	Yes	No	from central HMI connected to CER server	Yes
Depot Complex	2 nos.		Yes	Yes	HMI in Depot Security Room	From HMI in Central Security Control Room

255. Replace the provision of 10.1.10.1 (a) with following

All Access Control sites shall be connected/networked via FOTS system. The mode of networking i.e. either through Fibre or IP interface shall be decided during detailed design stage. The data base shall be centralized at the OCC and BCC containing the data of all the personnel authorized and issued with access control cards through OCC, BCC & Depots system. all changes pertaining to an area shall be synchronized from the central data base. Configuration of new card shall be done from Card Work station, which shall be part of ACS network.

256. 10.1.10.4 (C) replace para “Management of cardholder functions (only for the stand-alone Work Station at the OCC and the Depot)” with “Management of card holder functions to be done in a workstation which shall be part of ACS network.”

257. Replace the provision of Annexure A with following

Each Access Unit shall consist set of a Entry Card reader, Magnetic lock and Exit Push Button.

Chapter 11 T-SCADA

258. **Replace the provision of Chapter 11 with following**

Modified chapter 11 is enclosed as annexure III

Chapter 12 Appendix

259. **Replace the provision of Chapter 12 with following**

Modified chapter 12 is enclosed as annexure IV

Part III, Section VIII (General Conditions)

260. **Replace the provision of Contract data, Item No 5 with following**

Refer to Section IX **Particular Condition** Part B Table: Summary of Sections i.e. **142 weeks**

261. **Replace the provision of Contract data, Item No 6 with following**

24 months from the date of issue of Taking Over Certificate of reach 9reach1, 2, 3 & 4).

During the Defects Notification Period the Contractor shall provide, free of cost, competent and skilled personnel and maintain adequate stock of spares so as to promptly fulfill his obligations during the Defects Notification Period as laid down in GC and Employer's Requirements.

262. **Replace the provision of Contract data, Item No 7 with following**

Refer to Table: Summary of Sections in Section IX (PC) Part B

263. **Replace the provision of Contract data, Item No 18 with following**

Refer to Section IX **Particular Condition** Part B Table: Summary of Sections

264. **Replace the provision of Contract data, Item No 30 with following**

Liquidated Damages (LD) for delays in achievement of Key Dates (Major and Minor Key Dates as defined in 'Table – Summary of Sections (Key Dates) below will be applicable as noted below:

- i. For Minor Key Dates '1' to '7': 0.1% of the total value of the amounts apportioned to the affected Milestones relevant to the Key date for each Calendar day of delay.
- ii. For Major Key dates:
 - a) 0.1% of the total value of the amounts apportioned to the affected Milestones relevant to the Key date for each Calendar day of delay for first 30 Calendar days.

- b) 0.25% of the total value of the amounts apportioned to the affected Milestones relevant to the Key date for each Calendar day of delay for delays beyond 30 Calendar days.
- iii. In case of delay in accomplishment of the Major Key Dates, the total apportioned amount of all affected Milestones relevant to the associated Minor Key Dates as well as the Major Key Dates will be considered for calculation of LD.
- iv. Any imposition of LD on account of delay in accomplishing Minor Key Date will be waived and LD amount if deducted will be returned (without interest) provided Contractor is able to accomplish corresponding Major Key Date (as per Contracted Schedule)

265. Replace the provision of Contract data, Item No 36 with following

Price variation is not applicable

266. Replace the provision of Contract data, Item No 37 with following

14.1 (a)	The contract is a lump sum contract] Sub-paragraph 14.1 (a) is substituted by the Contract Price shall be the lump sum Accepted Contract Amount and be subject to adjustments in accordance with the Contract;
14.1(b)	The following taxes, duties and fees exemptions apply to the Contract: Refer PC – Clause No. 53
14.1(d)	If requested by the Engineer, the breakdown of all unit prices shall also be submitted by the Contractor within 28 days from the Commencement Date. Refer PC – Clause No. 53

267. Replace the provision of Contract data, Item No 45 with following

As provided for in PC [Clause No. 57](#)

268. Replace the provision of Contract data, Item No 51 with following

Amount of professional Indemnity Insurance (PII) As provided in PC Clause no. 70

Part III, Section IX, Particular Condition of Contract

269. Replace the provision of Clause 52 with following

GCC Sub-Clause 13.8, (Adjustments for Changes in Cost) is not applicable

270. Replace the provision of Clause 53(b) Service tax with following

(b) **Service Tax:** The Bidders are also to note that as per the Department of Revenue vide notification no. F. No. 334/8/2016-TRU dated 29.02.2016 has withdrawn exemption of Service Tax related to construction, erection, commissioning / installation of original works of Metro projects in respect of contracts entered into on or after 01.03.2016. The Contractor shall examine to make his own assessment in regard to service tax liability in the Contract. No separate service tax reimbursement will be made by NMRCL.

271. Replace the provision of Clause 70 with following

The Contractor shall effect and maintain professional, indemnity insurance, in the name of NMRCL, for the amount in Indian Rupees stipulated in Part III, Section VIII– at the end of General Conditions “Contract Data in respect of any design of the Works to be carried out by, or on behalf of the Contractor. This insurance, which shall ensure the Contractor's liability by reason of professional negligence and errors in the design of the works, shall be valid from the date of commencement of Works, until 5 years after the date of issue of Performance Certificate or 3 years after commencement of commercial train operations whichever is later. Alternatively, the Contractor shall redeem the insurance before the expiry of the Yearly Insurance in such a way that the entire validity period is covered.

The Engineer will not issue Final Payment Certificate until the Contractor has produced evidence that coverage of the professional indemnity insurance has been provided for the aforesaid period.

272. Replace the provision of Part B

Table: Summary of Sections (KEY DATES) with following

The Contractor will be required to achieve the following Key Dates (KD) to be calculated from the commencement date of Work

SCHEDULE OF KEY DATES

Key Date	Description	Time to Achieve (in Weeks)				
		Priority section	Reach-1	Reach-2	Reach-3	Reach-4
	Issue of LOA (Effective date of Contract)	D	D	D	D	D
KD1	Signing of Contract Agreement	D+4	D+4	D+4	D+4	D+4
KD2	Submission of preliminary design	D+5	D+15	D+15	D+15	D+15
KD3	Finalisation of Preliminary design	D+10	D+25	D+35	D+30	D+35
KD4	Obtain Consent of Employer's Engineer on Final Design Submission	D+11	D+35	D+45	D+40	D+45

KD5	Deliver On board Equipment to Rolling Stock Contractor		8 train set D+48	5 train set D+80	5 train set D+75	5 train set D+90
KD6	Delivery of CCTV, PIDS/PAS, MCS, IPABX, ACIDS Radio equipment and Telecommunication system at Contractor's premises in Nagpur.	D+18	D+50	D+85	D+75	D+95
KD7	Completion of site work & Testing of equipments	D+20	D+65	D+120	D+95	D+130
KD8	Commissioning & integrated testing of system	D+24	D+75	D+130	D+115	D+142
KD9	Completion of Contract	On Completion of DLP of complete works				

Notes:

1. Employer at its sole discretion may advise the Contractor about the change of Depot and Line any time six months before the scheduled Key Date for 'Delivery'
2. Engineer at his sole discretion will decide about substantial completion of work regarding Key Dates
3. All Key Dates are Minor key dates except Key Date Nos. 8, which is Major Key Dates
4. Equipment shall be commissioned in standalone mode for priority section.

5. SCHEDULE OF ACCESS DATES

5.1 Schedule of access Dates for Priority section

AD No.	Access Date	Priority Section
AD1	Access to Equipment Rooms	30.06.2017
AD2	Access to cable ducts/Hungers/Trays along the Viaduct	30.06.2017
AD3	Shared Access to Track	30.06.2017
AD4	Access to Permanent Power & OHE	30.06.2017

5.2 Schedule of access Dates for Reach-1

AD No.	Access Date	Reach-1
AD1	Access to Equipment Rooms	2nos Station Oct 2017, 5 nos Station June 2018
AD2	Access to cable ducts/Hungers/Trays along the Viaduct	50% Access in Dec 2017, 50% Access in June 2018
AD3	Shared Access to Track	50% Access in Jan 2018, 50% Access in July 2018

AD4	Access to Permanent Power & OHE	50% Access in Jan 2018, 50% Access in July 2018
------------	---------------------------------	---

5.3 Schedule of access Dates for Reach-2

AD No.	Access Date	Reach-2
AD1	Access to Equipment Rooms	2nos Station June 2018, 4 nos Station Sept 2018.
AD2	Access to cable ducts/Hungers/Trays along the Viaduct.	50% Access in Sep 2018, 50% Access in Dec 2018.
AD3	Shared Access to Track	50% Access in Oct 2018, 50% Access in Jan 2019.
AD4	Access to Permanent Power & OHE	50% Access in Oct 2018, 50% Access in Jan 2019.

5.4 Schedule of access Dates for Reach-3

AD No.	Access Date	Reach-3
AD1	Access to Equipment Rooms	2nos Station May 2018, 8 nos Station Oct 2018.
AD2	Access to cable ducts/Hungers/Trays along the Viaduct	50% Access in July 2018, 50% Access in Mar 2019.
AD3	Shared Access to Track	50% Access in Aug 2018, 50% Access in Apr 2019.
AD4	Access to Permanent Power & OHE	50% Access in Aug 2018, 50% Access in Apr 2019.

5.5 Schedule of access Dates for Reach-4

AD No.	Access Date	Reach-4
AD1	Access to Equipment Rooms	2nos Station Aug 2018, 6 nos Station Dec 2018.
AD2	Access to cable ducts/Hungers/Trays along the Viaduct.	50% Access in July 2018, 50% Access in Mar 2019.
AD3	Shared Access to Track	50% Access in Aug 2018, 50% Access in Apr 2019.
AD4	Access to Permanent Power & OHE	50% Access in Aug 2018, 50% Access in Apr 2019.

5.6 Schedule of access Dates for Sitabuldi Interchange

AD No.	Access Date	OCC Sitabuldi
AD1	Access to Equipment Rooms	30.03.2019

5.7 Schedule of access Dates for Metro House OCC/BOCC

AD No.	Access Date	Metro House OCC/BOCC
AD1	Access to Equipment Rooms	30.09.2017

5.8 Schedule of access Dates for Depots

AD No.	Access Date	Depot at Mihan	Depot at Hingna
AD1	Access to Equipment Rooms	31.03.2017	31.08.2018
AD2	Access to cable ducts/Hungers/ Trays along the Viaduct	31.03.2017	31.08.2018
AD3	Shared Access to Track	31.05.2017	28.08.2018
AD4	Access to Permanent Power & OHE	31.05.2017	28.09.2018

**MODIFIED ANNEXURE IV-A: INSTRUCTIONS FOR COMPLETING
THE PRICING DOCUMENT**

PART C ANNEXURE 1 TO ADDENDUM/CORRIGENDUM (VI)

CONTENTS

A. General Requirements

B. Apportionment of Fixed Lump Sum Price to Cost Centres & Milestones under Each Cost Centre

C. Statutory Clearance.....

D. Milestones Achievement Periods

E. Milestone Payment Schedule (MPS)

F. Bid Total

G. Cost Centre

H. Currency

PART C ANNEXURE 1 TO ADDENDUM/CORRIGENDUM (VI)

Instructions for completing the Pricing Document

A. General Requirements

- A.1 This is a fixed lump sum price Contract for Design, Manufacture, Supply, Installation, Testing and Commissioning of Telecommunication System (details of Works including configuration to be supplied are indicated in the [Section VIII. General Conditions, Part A – Contract Data](#) for Nagpur Metro Rail Project.

Bidder shall quote its fixed lump sum price inclusive of all taxes, levies, duties and other charges, including taxes to be deducted at source, leviable and payable to the authorities.

The Bidder shall be required to give in its Bid offer breakdown of his fixed lump Sum price clearly giving the following:

- (a) Customs duty on offshore manufactured items, if any along with rate of Custom duty.
- (b) Excise duty (after availing CENVET) on completely assembled / manufactured items, if any along with rate of Excise duty.
- (c) Customs duty on imported spares, jigs, fixtures, special tools and diagnostic equipments etc., forming part of [Cost Centre-F of Section MS](#) along with rate of Custom duty.
- (d) Excise duties on spares, jigs, fixtures, special tools and diagnostic equipments etc., forming part of [Cost Centre-F of Section MS](#) along with rate of Excise duty.
- (e) VAT on the completely assembled / manufactured equipment.
- (f) VAT on the indigenous finished spares, jigs, fixtures, special tools and testing and diagnostic equipments etc. forming part of [Cost Centre-F of Section MS](#) along with rate of VAT.
- (g) Works Contract Tax (WCT) along with applicable rate.
- (h) Octroi/Entry Tax (if any) and
- (i) other levies / cess etc. as applicable

The successful Bidder shall maintain complete records of duties, taxes, and levies etc. payable to various authorities in respect of equipment / assemblies / components, spares appearing in Cost Centre-F of Section MS and works and submit the receipts / records as and when demanded in writing by the Employer for verification. The Contractor shall undertake all custom clearance activities including all formalities, liaising with the custom authorities / custom house agents as well as transportation of goods to the site in Nagpur, and these activities shall be inclusive in the price.

PART C ANNEXURE 1 TO ADDENDUM/CORRIGENDUM (VI)

- A.1.1 Presently there is 'NO' waiver and exemption from the Government in respect of Customs Duty, Excise Duty, Taxes, other royalties, duties, Cess, Octroi / Entry Tax, and levies payable to various authorities.

Should the Employer obtain a waiver or exemption for any taxes and duties etc. in full or part thereof, the Contractor will be advised on the process to be followed to obtain exemption / refund of such taxes, duties etc., from the concerned Authorities. The Contractor shall arrange for the remittance of the refund so obtained to the Employer. In case of exemption, the Contractor shall pay the amount calculated by the Engineer on account of exemption to the Employer either separately or the Employer at its discretion shall deduct the calculated amount from any payments due to the Contractor under the Contract. In case of failure by the Contractor to obtain and remit the refund within reasonable time (to be decided by the Employer & intimated to the Contractor) to the Employer, the same will be recovered by the Employer from the amounts due as payment to the Contractor or as debt due from the Contractor. If the Contractor fails to take the required action to obtain refund or exemption, the Employer may take action in accordance with the Conditions of Contract.

- A.2 Not Used

A.3 Quantity Variation

- A.3.1 The Tenderer shall provide a Bill of Quantity (BoQ) in the format given in the Schedules (Pricing Document), to meet the entire scope of whole of works as stipulated in the Work's Requirements. The Tenderer shall note that NITL01/2016 is a lump sum contract and any change in quantities, other than those due to a change in scope of work, shall have no impact on the Contract price.

In case of increase in quantity beyond the original bid quantity, the Key Dates for the increased quantities shall be as specified in the '[Section IX. PC, Part B – 'Table – Summary of Sections'](#)'.

- A.3.2 Variation of any item in BOQ due to change in scope of work during execution, provided the change in Contract value is within $\pm 25\%$, shall be applied at the unit rate quoted by the Tenderer in Schedules (Pricing Document) and no additional amount whatsoever shall be payable to the Contractor (pricing mechanism as per [Annexure 5 of Pricing Document](#)), The Employer may exercise any increase in quantity on any date upto scheduled opening of the last section

- A.3.3 Not Used

- A.3.4 NMRCL shall reimburse the 'taxes and duties' for the variation quantity as detailed above. The reimbursement of 'taxes and duties' actually paid shall be restricted to the amount of 'taxes and duties' applicable for the quantities actually supplied to the Employer calculated on pro-rata basis from the 'Taxes & Duties' for the Contract submitted by the Bidder in the '[Appendix to Bid Total](#)' page of Pricing Document.

- A.3.5 Not Used.

PART C ANNEXURE 1 TO ADDENDUM/CORRIGENDUM (VI)

A.3.6 The Contract Price in equivalent INR shall not be adjusted on account of fluctuations in the rates of exchange between the foreign currencies of the Contract and Indian Rupees from the Base Date i.e. the last working day, 'Twenty-eight days prior to date for Bid submission. Payments however shall be made in the currencies as quoted by the Contractor.

B. Apportionment of Fixed Lump Sum Price to Cost Centres & Milestones under Each Cost Centre

B.1 The whole of the Works including design, are divided into Reaches, primarily on a geographical basis. Each Reach is divided into the various Cost Centers named according to their general scope of work.

B.2 The fixed Lump Sum price for whole of the Works shall be apportioned by the Bidder amongst the various Reaches. The apportioned amount for each Reach will be further distributed among various Cost Centres included in that Reach separately for foreign currency and for the Rupee portion. The apportioned amount for each Cost Centre will be further distributed amongst various Milestones included in that Cost Centre, separately for the foreign currency and the Rupee portion.

B.3 The sum of amounts shown against Milestones in a Cost Centre is the Cost Centre Amount that is to be carried forward to the Bid Total. For Cost Centres that involve payment in foreign currency, the division of the respective Cost Centre Amounts between Columns A and B shall be shown in the said Summary.

B.4 The scope and extent of the Works are to be ascertained by reference to the Contract documents as a whole and shall not be limited in any manner whatsoever by the descriptions of the Cost Centres or of the Milestones under each Cost Centre, as given in the Appendices to the Pricing Document.

B.5 The maximum / minimum amount that can be apportioned to different Cost Centres is indicated in the enclosed Pricing Document.

C. Statutory Clearance

The Contractor shall be solely responsible for all the statutory clearances including customs, excise, taxes, levies, octroi, transportation etc. required for the successful execution of this Contract.

D. Milestones Achievement Periods

The Milestones under each Cost Centre shall identify verifiable steps towards the completion of the work within that Cost Centre. The Bidder shall indicate the periods (in weeks from the Commencement Date of the Works) within which it shall achieve each Milestone. Milestones that lead to the achievement of a Stage (as described in the Key Date schedule provided under [Section IX PC, Part B Table – Summary of Sections](#)) must always precede the Key Date for achievement of that Stage. Milestones shall be converted to calendar dates from the Commencement date as given in the Notice to Proceed.

PART C ANNEXURE 1 TO ADDENDUM/CORRIGENDUM (VI)

E. Milestone Payment Schedule (MPS)

- E.1 The MPS completed by the Contractor shall set out the maximum cumulative amount for each currency for all Cost Centres put together in relation to each month for which payment for that Cost Centre may be sought in accordance with [Clause 14](#) of the GC. This information should also be presented in graphic and tabular form. The Monthly Cash flows shall be worked out as per the Methodology laid down in [Form 12 under Section IV: Bidding Forms](#). Milestones Payment Schedules showing Monthly Cash Flow for the Contract will form part of the Pricing Document.

F. Bid Total

- F.1 The Bid Total submitted by the Bidder shall be in the format shown in the Pricing document. The “Lump sum Price” for the Contract mentioned in the “Bid Total” page shall not include the Price of withdrawal of any remark, comment, condition, qualification or deviation etc. quoted in the “[Annexure-4](#)”.
- F.2 The Pricing Document contains Cost Centres and Milestones under each Cost Centre. The Cost Centres and Milestones have been prepared to indicate the extent of detail required in the Bidding Documents. The Bidder shall prepare and complete documents, in this format, as being its Bid and submit as part of the Financial Package. Items / Milestones against which no rate or sum is entered by the Bidder, whether quantities are stated or not, shall be regarded as covered by other rates in the pricing document.
- F.3 The Pricing Document, completed and submitted by the Bidder, as part of its Bid, should use an indexing and page numbering system such that its extent and completeness is clearly evident.

G. Cost Centre

- G.1 Cost Centres and Milestones there under are fixed and shall not be changed by the Bidder. These represent the major items of the Works for which the Employer will pay the Contractor, and the Bidder shall ensure that it has allowed for all costs it requires for the Contract to be apportioned among the Cost Centres.
- G.2 The Bidder shall divide pricing of Cost Centres into Columns A and B, if payments in foreign currency are to be sought. Items of Cost Centres that apply in one currency only shall be given a NIL price in the other column.

H. Currency

Reach Totals, Cost Centre Totals and Milestone amounts shall be indicated in Indian Rupees and in foreign currency where required.

MODIFIED ANNEXURE IV-B: PRICING DOCUMENT

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

BID TOTAL

[To be Completed and Submitted by the Bidder as part of 'Schedules' under Section IV: Bidding Forms]

The fixed Lump Sum Price of this Contract for Telecommunication System is:

Foreign Currency	Indian Rupees
In figures:	In figures:
In words:	In words:

SECTION INCLUDING DEPOTs, OCC, RSS, BCC & HQ

Apportionment of Lump Sum Price among Cost Centres

Cost Centre	Cost Centre* Description	Total Apportioned Amounts of Cost Centre Items	
		Foreign Currency [Col A]	Indian Rupees [Col B]
A	Plans & Design Document		
B	Manufacture, and Delivery		
C	Installation and Site Testing		
D	System Acceptance Test, Integrated Testing and Commissioning		
	BID TOTAL (A to D)		

SECTION MS - MISCELLANEOUS

Cost Centre	Cost Centre* Description	Total Apportioned Amounts of Cost Centre Items	
		Foreign Currency [Col A]	Indian Rupees [Col B]
E	Training		
F	Spares, Special Tools, Testing Equipment and Measuring Instruments		
G	Supervision of Maintenance and DLP		
	BID TOTAL (E to G)		

In case of more than one foreign currency, split Column A more sub-Columns.

Note: Apportioned Price milestone wise to be indicated in above table, which shall be matched with apportioned amount in **APPENDIX 1: BILL OF QUANTITIES FOR N1TL01/2016.**

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Appendix to Bid Total

DETAILS OF TAXES / DUTIES / LEVIES ETC. INCLUDED IN THE FIXED LUMP SUM PRICE (COST CENTRE WISE)

(Refer Para A.1 of Part I Annexure IV A 'Instructions for completing the Pricing Document')

Cost Centre	Taxes, Duties, Levies etc.														Total Amount of all Taxes / Duties / Levies / Cess (8) = Sum of (1) to (7)
	Custom Duty		Excise Duty		Sales tax / VAT		Works Contract Tax (WCT)		Service Tax		Octroi / Entry Tax		Any other Tax / Levy / Cess		
	(1) Rate (%)	(1) Amount t	(2) Rate (%)	(2) Amount t	(3) Rate (%)	(3) Amount t	(4) Rate (%)	(4) Amount t	(5) Rate (%)	(5) Amount t	(6) Rate (%)	(6) Amount t	(7) Rate (%)	(7) Amount t	
Section Including Depot															
A															
B															
C															
D															
Section MS – Miscellaneous															
E															
F															
G															
Total															

Notes:

The Bidder is required to give in its Bid offer breakdown of fixed lump sum price clearly giving the following:

- (a) Customs duty on offshore manufactured items, if any along with rate of Custom duty.
- (b) Excise duty (after availing CENVAT) on completely assembled / manufactured equipment, if any along with rate of Excise duty.
- (c) Customs duty on imported Spares, Special Tools, Testing Equipment and Measuring Instruments etc. forming part of **Cost Centre-F of Section MS** along with rate of Customs duty.
- (d) Excise duties on Spares, Special Tools, Testing Equipment and Measuring Instruments etc. forming part of **Cost Centre-F of Section MS** along with rate of Excise duty.
- (e) VAT on the completely assembled / manufactured equipment.
- (f) VAT on the indigenous finished Spares, Special Tools, Testing Equipment and Measuring Instruments etc. forming part of **Cost Centre-F of Section MS** along with rate of VAT.
- (g) Works Contract Tax (WCT) along with applicable rate.
- (h) Octroi / Entry Tax (if any) and
- (i) Other levies / Cess etc. as applicable
- (j) The amount mentioned other than INR for the purpose of comparison of the applicable taxes and levies, the exchange rate prevailing on the date 28 days before the latest date of submission of the Bid would be considered.

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

NAGPUR METRO RAIL CORPORATION LIMITED

DESIGN, MANUFACTURE, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF TELECOMMUNICATION SYSTEM

CONTRACT NO. N1TL01/2016

(To be submitted as part of 'Form 3. Schedules' under Section IV: Bidding Forms)

Annexure-1 INDEX OF COST CENTRES

Cost Centre	Cost Centre* Description	Cost to be apportioned
A	Plans & Design Documents	Not more than 7.5%
B	Manufacture, and Delivery	Not more than 40%
C	Installation and Site Testing	Not more than 15%
D	System Acceptance Test, Integrated Testing and Commissioning	Not less than 15%

SECTION MS - MISCELLANEOUS

Cost Centre	Cost Centre* Description	Cost to be apportioned
E	Training	Amount quoted in section MS and relevant cost centre shall be actual cost & not apportioned cost
F	Spares, Special Tools, Testing Equipment and Measuring Instruments	
G	Supervision of Maintenance and DLP	

Note: DLP shall be of 24 months for respective reach. DLP shall be reach wise and shall have individual & independent start date and end dates for each reach as per Project schedule.

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

PRICING DOCUMENT Annexure-1

SCHEDULE OF AMOUNTS APPORTIONED TO COST CENTRES

Cost Centre Descriptions

(To be completed and submitted as part of 'Form 3. Schedules' under Section IV: Bidding Forms)

1. Priority Section(PS)

1.1 PS - COST CENTRE No. A: Plans & Design Documents

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre. This Cost Centre includes but is not limited to:

- A. Contractor's Project Plan, Document Submission Procedure, Design Documents Submission, Health, Safety & Environment Plans,
- B. Works Programme and Document Submission Programme.
 - Project Management Plans and other Plans as per document list.
 - EMC Management Plan
 - System safety plan,
 - System Verification & Validation Plan
 - System Assurance Plans.
 - SHE Plan
 - Furnishing of training manuals and associated materials.
 - Others
- C. Preliminary System Design for Telecommunication Systems, consisting of:
 - System and Sub-System Overview and preliminary design.
 - System requirement specification, System traceability specification, Design Verification Table.
 - Detailed Design and Configuration Details
 - Installation Drawings and Documents
 - Tests Plans
 - Train to Wayside bidirectional communication scheme plan.
 - Specifications for Indoor and Line side Equipment's including the requirement for power,
 - Space and preliminary mounting details for main line and depot.
 - Layout plan for equipment and cables for UPS system for Telecommunication.
 - Any other item(s) considered necessary to comply with the Scope of Work.

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Priority Section -COST CENTRE No. A: Plans & Design Document

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ____” from the Engineer for:			
1	Contractor’s Project Plan, Document Submission Programme, Health, Safety & Environment Plans and other Plans			
2	Works Programme for section Provide, erect and equip Project Site office.			
3	Preliminary System design for Telecommunication System System Block Diagram.			
4	Earthing, Lightening and Surge Protection Plan			
5	Specifications for Indoor and Line side Equipments including the requirement for power, space and Preliminary mounting details for main line and depots			
6	Layout plan for equipment and cables for equipment and cables for UPS system for Telecom for complete contract			
7	Interface Management Plan with Designated Contractors			
8	List of Materials required and Delivery Schedule thereof			
9	Final Design/Application Engineering for Telecommunication systems.			
10	Final drawings for the accepted Final Design for Telecommunication systems.			
11	Application/ Configuration Documents for stations and main lines			
12	Application/ Configuration Documents for Depot/Control Center			
13	Factory Acceptance Test Plans and Type Test Plans including planning, methodology and checklists			
14	Application Drawings for Depot / Control Room			
15	Testing & Commissioning Documents including Testing Plans, Service Trials in standalone mode Plan for Telecommunication System			
16	Any other item(s) considered necessary to comply with Scope of Work			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

1.2 Priority Section -COST CENTRE No. B: Manufacture, and Delivery

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre. This includes but is not limited to:

Receipt /delivery of following equipment after type test, factory acceptance test, and proof of insurance: at Contractor's premises in Nagpur

TELECOMMUNICATION SYSTEM

- A. Delivery of PAS & PIDS and associated accessories for Stations
- B. Delivery of FOTS, networking, master clock system and associated accessories
- C. Delivery of radio system equipment and associated accessories including mobile sets
- D. Delivery of EPABX and direct line telephone network, digital voice recorder and associated accessories
- E. Delivery of CCTV , Access Control and associated accessories for Stations
- F. Delivery of optic fibre cable and associated accessories.
- G. Delivery of telephone cable and associated accessories
- H. Delivery of Access Control and Intrusion Detection System and associated accessories for Stations, SCRs
- I. Any other item(s) considered necessary to comply with Scope of Work

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Priority section COST CENTRE No. B: Manufacture, and Delivery

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity			
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ____” from the Engineer after: - Issue of Inspection Certificate on satisfactory completion of all Factory Tests / running - Marine Insurance - Documents for shipment to Indian Port - Transit insurance from Port in India to Depot Site in Nagpur. - Material Inspection at Depot / Warehouse - Delivery at Contractor’s premises in Nagpur. for:			
1	Delivery of PAS Equipment and associated accessories for stations			
2	Delivery of PIDS equipment and associated accessories for stations			
3	Delivery of FOTS, Networking, master clock system, equipment and associated accessories for stations			
4	Delivery of radio system central control equipment, base station(s), antennae, antennae supporting structure, radio control/workstations/access units and associated accessories for stations			
5	Delivery of hand portable radios and associated accessories			
6	Delivery of EPABX and direct line telephone network, digital voice recorder and associated accessories for stations			
7	Delivery of CCTV and associated accessories for stations			
8	Delivery of Access Control and Intrusion Detection System and associated accessories			
9	Delivery of optic Fibre cable and associated accessories.			
10	Delivery of telecom, power & data cables and associated accessories			
11	Delivery of equipment and associated accessories for Depot			
12	Any other item(s) considered necessary to comply with Scope of Work.			
	COST CENTRE TOTAL			

Notes:

1. It is certified that ‘Annexure-1’ annexed in Technical Package is a “TRUE COPY” (with prices blanked off) of the said ‘Annexure-1’ annexed in the Financial Package.

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

1.3 Priority Section COST CENTRE No. C: Installation, Site Testing

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.

This includes but is not limited to:

TELECOMMUNICATIONS SYSTEM

A. Indoor Equipment: Shifting to Site from Contractor's premises in Nagpur, installation and testing of all equipment including FOTS, clocks, telephone system, radio system, PAS, CCTV system, ACID, PIDS and associated servers hardware & accessories:

- Site preparations
- Complete fixing and wiring of indoor equipment in accordance with circuit and installation diagrams.
- **Post installation tests including** Pre-power up checking, power up customization and configuration of equipment

B. Outdoor Equipment: Shifting to Site from Contractor's premises in Nagpur, installation and testing of all equipment including optical fibre cable, telephone cables, clocks, telephones, Radio Tower & Equipment, loudspeakers and associated equipment, CCTV monitors, cameras and associated equipment, PIDS display boards including erection of junction boxes, wiring and terminations etc.

- Receipt of equipment at Site, pre-installation tests, inspection of equipment and Site preparations.
- Complete fixing and wiring of equipment in accordance with circuit and installation diagrams.
- **Post installation tests including Pre-power up checking, power up, customization and configuration of equipment**

C. Perform Partial Acceptance Tests in accordance with the accepted PAT Plan for Telecommunications.

D. Any other item(s) considered necessary to comply with the Scope of Works

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Priority section - COST CENTRE No. C: Installation, Site Testing

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for:			
1	Shifting to Site from Contractor's Premises in Nagpur, installation and testing (includes pre-installation tests, post installation tests and PAT for all sub-systems) of all indoor equipment such as FOTS, networking, clocks, CSS, telephone system, radio system, PAS, CCTV system, PIDS, etc and associated accessories.			
2	Shifting to Site from Contractor's Premises in Nagpur installation and testing (includes pre installation tests, post installation tests and PAT for all sub-systems) of all outdoor equipment such as FOTS, Networking, clocks and CSS, telephone system, radio system, PAS, CCTV system and PIDS, etc and associated accessories			
3	Provision and Installation and testing of Train Radio Tower(s) and other Telecom Systems			
4	Completion of Partial Acceptance Tests for Telecommunication systems.			
5	Any other item(s) considered necessary to complete the scope of Works of Telecommunication.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

Note: System Acceptance & Integrated Test for the Priority section will be carried out with Reach-1.

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

1.4 Priority Section - COST CENTRE No. D: System Acceptance Test, Integrated Testing and Commissioning

(This Milestone shall be completed and claim along with Reach 1 Stage)

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.

This shall include but not be limited to:

- A. System Acceptance Tests in accordance with the accepted SAT Plan for Telecommunications
- B. Integrated testing and commissioning documents
- C. Integrated Testing and Commissioning
- D. Service Trials & System Safety Case of the Telecommunication Systems
- E. Complete configuration software backup data for all subsystems including section, trains, depot,
- F. As built Drawings
- G. Any other item(s) considered necessary to comply with the Scope of Work.

Priority Section - COST CENTRE No. D: System Acceptance Test, Integrated Testing and Commissioning

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ---“ from the Employer’s Representative for			
1	Completion of System Acceptance Test			
2	Completion of Integrated Testing & Commissioning.			
3	Completion of Service Trials.			
4	Completion of integration of Telecom with system of other designated contractors.			
5	Complete configuration software backup data for all subsystems including section, trains, depot			
6	As built drawings. Drawings			
7	Any other item(s) considered necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

1.5 Priority Section - SECTION MS - (MISCELLANEOUS)

COST CENTRE No. E – Training

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.

This shall include but not be limited to:

- Provision of Instructors by the Contractor for training of operating and maintenance personnel of the Employer in India
- Training of operating and maintenance personnel of the Employer at the OEM facilities and overseas.

Any other item(s) considered necessary to comply with the Scope of Work.

Notes: The travel boarding and lodging expenses for the Employer's trainees shall be borne by the Employer.

Priority Section - SECTION MS - (MISCELLANEOUS)

COST CENTRE E – Training

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for:			
1	Training of Employer's personnel (30 man days) overseas in OEM premises. (Number of Trainees as per employer's discretion)			
2	Provision of OEM's Instructors (12 days) for training of Employer's Operating & Maintenance personnel in India. (Number of Trainees as per employer's discretion)			
3	Submission of Training Manuals (Original plus two hard copies) and in electronic format.			
4	Any other item(s) necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

1.6 Priority Section COST CENTRE No. F (MISCELLANEOUS): Spares, Special Tools, Testing Equipment and Measuring Instrument

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre. This shall include but not be limited to:

- Supply of Spares for Telecommunication systems.
- Supply of special tools and equipment, testing and measuring instruments
- Any other item(s) considered necessary by the Contractor to comply with the Scope of Work.

Priority Section COST CENTRE No. F (MISCELLANEOUS): Spares, Special Tools, Testing Equipment and Measuring Instrument

Milestone No.	Work Description	Foreign Currency	Indian Rupees	Weeks from Commencement
	Milestone Activity	Column A	Column B	Date
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for delivery of the following in accordance with the Work's Requirements:			
1	Delivery of spares			
2	Delivery of special tools, Testing Equipment and Measuring Instrument			
3	Any other item(s) considered necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

1.7 Priority Section COST CENTRE No. G (MISCELLANEOUS): Supervision Of Maintenance and DLP Support (for the commissioned and tested Systems)

This Cost Centre comprises supervision of maintenance of Telecommunication systems:

- The Contractor shall provide experts for supervision of maintenance in accordance with the Work’s Requirements
- Defect Liability Support (DLP support.)

Note: The deployment of the experts under this Cost Centre may not be continuous and they may be required to supervise the maintenance in short periods at a time. Payment for this Cost Centre will be made on man-month basis.

Priority Section -COST CENTRE No. G (MISCELLANEOUS): Supervision of Maintenance & DLP Support

Milestone No.	Work Description	Foreign Currency	Indian Rupees	Total Cost of Supervision of Maintenance & DLP Support
	Milestone Activity	Column A	Column B	
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ---“ from the Employer’s Representative for completion of the following in accordance with the Work’s Requirements:			
1	Supervision of Maintenance and DLP Support.			
2	DLP Support.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

2. Reach -1

2.1 Reach 1 - COST CENTRE No. A: Plans & Design Document

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre. This Cost Centre includes but is not limited to:

- A. Contractor's Project Plan, Document Submission Procedure, Design Documents Submission, Health, Safety & Environment Plans (SHE), Interface Management Plan with Designated Contractors.
- B. Works Programme and Document Submission Programme.
 - Project Management Plans and other Plans as per document list.
 - EMC Management Plan
 - RAMS Plans
 - Software Quality Assurance Plan
 - Quality Plan
 - System Verification & Validation Plan
 - System Assurance Plans.
 - Furnishing of training manuals and associated materials.
 - Others
- C. Preliminary System Design for Telecommunication Systems, consisting of:
 - System and Sub-System Overview and preliminary design.
 - System requirement specification, System traceability specification, Design Verification Table.
 - Detailed Design and Configuration Details
 - Detailed Interface Design Document
 - Installation Drawings and Documents
 - Tests Plans
 - Train to Wayside bidirectional communication scheme plan.
 - Specifications for Indoor and Line side Equipments including the requirement for power,
 - Space and preliminary mounting details for main line and depot.
 - Layout plan for equipment and cables in, Backup OCC, Depot, RSS & Metro Bhavan
 - Layout plan for equipment and cables for UPS system for Telecommunication.
 - Any other item(s) considered necessary to comply with the Scope of Work.

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Reach 1 -COST CENTRE No. A: Plans & Design Document

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ____” from the Engineer for:			
1	Contractor’s Project Plan, Document Submission Programme, Safety, Health & Environment Plans and other Plans			
2	Preliminary System design for Telecommunication System System Block Diagram.			
3	Earthing, Lightening and Surge Protection Plan			
4	Specifications for Indoor and Line side Equipments including the requirement for power, space and preliminary mounting details for main line and depots			
5	Layout plan for equipment and cables in OCC, Backup OCC, RSS & Depot & stations. Layout plan for equipment and cables for UPS system for Telecom			
6	Interface Management Plan with Designated Contractors			
7	List of Materials required and Delivery Schedule thereof			
8	Detailed Interface Documents with the Designated Contractors			
9	Final Design/Application Engineering for Telecommunication systems.			
10	Final drawings for the accepted Final Design for Telecommunication systems.			
11	Application/ Configuration Documents/Drawings for stations, OCC, Backup OCC, RSS, Depot and main lines			
12	Factory Acceptance Test Plans and Type Test Plans including planning, methodology and checklists			
13	Any other item(s) considered necessary to comply with Scope of Work			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

2.2 Reach 1 -COST CENTRE No. B: Manufacture and Delivery

This Cost Centre comprises all those obligations and on-going activities throughout the Contract not associated directly with any other Cost Centre.

This includes but is not limited to:

Receipt /delivery of following equipment after type test, factory acceptance test, and proof of Insurance at Contractor's premises in Nagpur:

TELECOMMUNICATION SYSTEM

- A. Delivery of PA system and associated accessories.
- B. Delivery of PIDS and associated accessories
- C. Delivery of FOTS, networking, master clock system & equipment and associated accessories
- D. Delivery of radio system equipment and associated accessories including hand portable
- E. Receipt of on board radio equipment by Rolling Stock Contractor at site in Nagpur
- F. Delivery of CCTV system and associated accessories
- G. Delivery of EPABX and direct line telephone network, digital voice recorder and associated accessories
- H. Delivery of Access Control and Intrusion Detection System and associated accessories
- I. Delivery of T-SCADA system and associated accessories
- J. Delivery of optic fibre cable and associated accessories.
- K. Delivery of telephone cable and associated accessories
- L. Delivery of equipment & accessories for Backup OCC, RSS, Metro Bhavan & Depot.
- M. Any other item(s) considered necessary to comply with Scope of Work

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

COST CENTRE No. B: Manufacture, and Delivery

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency Column A	Indian Rupees Column B	
	Milestone Activity			
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ____” from the Engineer after: <ul style="list-style-type: none"> - Issue of Inspection Certificate on satisfactory completion of all Factory Tests / running - Marine Insurance - Documents for shipment to Indian Port - Transit insurance from Port in India to Depot Site in Nagpur. - Material Inspection at Depot / Warehouse - Delivery of equipment at Contractor’s premises in Nagpur. for:			
1	Delivery of PAS Equipment and associated accessories			
2	Delivery of PIDS equipment and associated accessories			
3	Delivery of FOTS, Networking, master clock system and CSS equipment and associated accessories			
4	Delivery of EPABX and direct line telephone network, digital voice recorder and associated accessories			
5	Delivery of radio system central control equipment, base station(s), antennae, antennae supporting structure, radio control/workstations/access units and associated accessories			
6	Delivery of hand portable radios and associated accessories			
7	Receipt of on board radio equipment, radio control head and associated accessories for the Rolling Stock Contractor			
8	Delivery of CCTV and associated accessories			
9	Delivery of optic fibre cable and associated accessories			
10	Delivery of Access Control and Intrusion Detection System and associated accessories			
11	Delivery of telecom, power & data cables and associated accessories at contractor’s premises in Nagpur.			
12	Delivery of Back up OCC equipment and associated accessories for Telecom at Contractors premises in Nagpur			
13	Delivery of Depot & RSS equipment and associated accessories			
14	Delivery of Telecom SCADA System and associated accessories for backup OCC			
15	Any other item(s) considered necessary to comply with Scope of Work.			
	COST CENTRE TOTAL			

Notes: It is certified that ‘Annexure-1’ annexed in Technical Package is a “TRUE COPY” (with prices blanked off) of the said ‘Annexure-1’ annexed in the Financial Package.

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

2.3 Reach 1 COST CENTRE No. C: Installation, Site Testing

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.

This includes but is not limited to:

TELECOMMUNICATIONS SYSTEM

A. Indoor Equipment: Shifting from Contractor's premises in Nagpur to Site, installation and testing of all equipment including FOTS, clocks, CDRS, RADIO, telephone system, radio system, PAS, CCTV system, PIDS, T SCADA and associated servers hardware & accessories:

- Site preparations
- Complete fixing and wiring of indoor equipment in accordance with circuit and installation diagrams.
- **Post installation tests including** Pre-power up checking, power up customization and configuration of equipment

B. Outdoor Equipment: Shifting to Site from Contractor's premises in Nagpur, installation and testing of all equipment including optical fibre cable, telephone cables, clocks, telephones, Radio Tower & Equipment, loudspeakers and associated equipment, CCTV monitors, cameras and associated equipment, PIDS display boards including erection of junction boxes, wiring and terminations etc.

- Receipt of equipment at Site, pre-installation tests, inspection of equipment and Site preparations.
- Complete fixing and wiring of equipment in accordance with circuit and installation diagrams.
- **Post installation tests including Pre-power up checking, power up, customization and configuration of equipment**

C. Perform Partial Acceptance Tests in accordance with the accepted PAT Plan for Telecommunications.

D. Onboard Equipment:

- Completion of Installation and testing of all on-board equipment for train-radio and their associated accessories in 8 train set, as certified jointly in writing, by the Contractor and Rolling Stock Contractor for the satisfactory installation and testing of the on-board equipment.
- Submit certificate jointly signed by the NITL01 Contractor and Rolling Stock Contractor for the satisfactory testing of the on-board equipment.

Any other item(s) considered necessary to comply with the Scope of Works

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Reach 1- COST CENTRE No. C: Installation, Site Testing

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for:			
1	Shifting from Contractor's Premises in Nagpur to Site, installation and testing (includes pre-installation tests, post installation tests and PAT for all sub-systems) of all indoor equipment such as FOTS, networking, clocks, CSS, telephone system, radio system, PAS, CCTV system, PIDS, etc and associated accessories.			
2	Shifting from Contractor's Premises in Nagpur to Site. Installation and testing (includes pre installation tests, post installation tests and PAT for all sub-systems) of all outdoor equipment such as FOTS, Networking, clocks and CSS, telephone system, radio system, PAS, CCTV system and PIDS, etc and associated accessories			
3	Obtain as above for Back up OCC, Metro Bhavan, Depot & RSS			
4	Provision and Installation and testing of Train Radio Tower(s)			
5	Completion of Partial Acceptance Tests for Telecommunication systems.			
6	Testing & Commissioning Documents			
7	Any other item(s) considered necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

2.4 Reach 1 - COST CENTRE No. D: System Acceptance Test, Integrated Testing and Commissioning (Along with Priority Section Stations)

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.

This shall include but not be limited to:

- A. System Acceptance Tests in accordance with the accepted SAT Plan for Telecommunications
- B. Integrated testing and commissioning documents
- C. Integrated Testing and Commissioning
- D. Service Trials, System Safety Case of the Telecommunication Systems.
- E. Complete configuration software backup data for all subsystems including section, trains, depot, OCC.
- F. As built Drawings
- G. Any other item(s) considered necessary to comply with the Scope of Work.

Reach 1 - COST CENTRE No. D: System Acceptance Test, Integrated Testing and Commissioning

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for			
1	Completion of System Acceptance Tests			
2	Completion of Integrated Testing & Commissioning.			
3	Completion of Service Trials.			
4	Completion of integration of Telecom with system of other designated contractors.			
5	Complete configuration software backup data for all subsystems including section, trains, depot and OCC			
6	Submission of As built drawings.			
7	System Safety Case for Telecom system.			
8	Any other item(s) considered necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

2.5 Reach 1 - SECTION MS - (MISCELLANEOUS)

COST CENTRE No. E – Training

<p>This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.</p> <p>This shall include but not be limited to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Provision of Instructors by the Contractor for training of operating and maintenance personnel of the Employer in India <input type="checkbox"/> Training of operating and maintenance personnel of the Employer offshore at the OEM's premises and Metro. <p style="text-align: center;">Any other item(s) considered necessary to comply with the Scope of Work.</p>
--

Notes: The travel boarding and lodging expenses for the Employer's trainees sent overseas shall be borne by the Employer.

SECTION MS - (MISCELLANEOUS)

COST CENTRE E – Training

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency Column A	Indian Rupees Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for:			
1	Training of Employer's personnel (45 man-days) overseas in OEMs premises and Metro. (Number of Trainees as per employer's discretion)			
2	Provision of Contractor's Instructors (20 days) for training of Employer's Operating & Maintenance personnel in India. (Number of Trainees as per employer's discretion)			
3	Submission of Training Manuals (Original plus two hard copies) and in electronic format.			
4	Any other item(s) necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

2.6 Reach 1 COST CENTRE No. F (MISCELLANEOUS): Spares, Special Tools, Testing Equipment and Measuring Instrument

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.

This shall include but not be limited to:

- Supply of Spares for Telecommunication systems.
- Supply of special tools and equipment, testing and measuring instruments
- Any other item(s) considered necessary by the Contractor to comply with the Scope of Work.

Reach 1 COST CENTRE No. F (MISCELLANEOUS): Spares, Special Tools, Testing Equipment and Measuring Instrument

Milestone No.	Work Description	Foreign Currency	Indian Rupees	Weeks from Commencement
	Milestone Activity	Column A	Column B	Date
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for delivery of the following in accordance with the Work's Requirements:			
1	Delivery of spares			
2	Delivery of special tools Testing Equipment and Measuring Instrument.			
3	Any other item(s) considered necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

2.7 Reach1 COST CENTRE No. G (MISCELLANEOUS): Supervision Of Maintenance and DLP Support

This Cost Centre comprises supervision of maintenance of Telecommunication systems:

- The Contractor shall provide experts for supervision of maintenance in accordance with the Work's Requirements
- Defect Liability Support (DLP support.)

Notes: The deployment of the experts under this Cost Centre may not be continuous and they may be required to supervise the maintenance in short periods at a time. The number of days of experts shall, however, not less than 750 man-days for the Reach 1. Payment for this Cost Centre will be made on man-month basis.

Reach 1 COST CENTRE No. G (MISCELLANEOUS): Supervision Of Maintenance and DLP Support

Milestone No.	Work Description	Foreign Currency	Indian Rupees	Total Cost of Supervision of Maintenance & DLP Support
	Milestone Activity	Column A	Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to - --" from the Employer's Representative for completion of the following in accordance with the Work's Requirements:			
1	Supervision of Maintenance			
2	DLP Support.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

3. Reach -2

3.1 Reach 2 - COST CENTRE No. A: Plans & Design Document

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre. This Cost Centre includes but is not limited to:

- A. Contractor's Project Plan, Document Submission Procedure, Design Documents Submission, Health, Safety & Environment Plans (SHE), Interface Management Plan with Designated Contractors.
- B. Works Programme and Document Submission Programme .
 - Project Management Plans and other Plans as per document list.
 - EMC Management Plan
 - RAMS Plans
 - Software Quality Assurance Plan
 - Quality Plan
 - System Verification & Validation Plan
 - System Assurance Plans.
 - Furnishing of training manuals and associated materials.
 - Others
- C. Preliminary System Design for Telecommunication Systems, consisting of:
 - System and Sub-System Overview and preliminary design.
 - System requirement specification, System traceability specification, Design Verification Table.
 - Detailed Design and Configuration Details
 - Detailed Interface Design Document
 - Installation Drawings and Documents
 - Tests Plans
 - Train to Wayside bidirectional communication scheme plan.
 - Specifications for Indoor and Line side Equipments including the requirement for power,
 - Space and preliminary mounting details for main line and depot.
 - Layout plan for equipment and cables for UPS system for Telecommunication.
 - Any other item(s) considered necessary to comply with the Scope of Work.

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Reach 2 -COST CENTRE No. A: Plans & Design Document

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to _____” from the Engineer for:			
1	Contractor’s Project Plan, Document Submission Programme, Safety, Health & Environment Plans and other Plans			
2	Preliminary System design for Telecommunication System System Block Diagram.			
3	Earthing, Lightning and Surge Protection Plan			
4	Specifications for Indoor and Line side Equipments including the requirement for power, space and preliminary mounting details for main line and depots			
5	Layout plan for equipment and cables in station Layout plan for equipment and cables for UPS system for Telecom			
6	Interface Management Plan with Designated Contractors			
7	List of Materials required and Delivery Schedule thereof			
8	Detailed Interface Documents with the Designated Contractors			
9	Final Design/Application Engineering for Telecommunication systems.			
10	Final drawings for the accepted Final Design for Telecommunication systems.			
11	Application/ Configuration Documents/Drawings for stations, , Backup OCC, RSS, Depot and main lines			
12	Factory Acceptance Test Plans and Type Test Plans including planning, methodology and checklists			
13	Any other item(s) considered necessary to comply with Scope of Work			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

3.2 Reach 2 -COST CENTRE No. B: Manufacture & Delivery

This Cost Centre comprises all those obligations and on-going activities throughout the Contract not associated directly with any other Cost Centre.

This includes but is not limited to:

Receipt /delivery of following equipment after type test, factory acceptance test, and proof of Insurance at Contractor's premises in Nagpur:

TELECOMMUNICATION SYSTEM

- A. Delivery of PA system and associated accessories.
- B. Delivery of PIDS and associated accessories
- C. Delivery of FOTS, networking, master clock system & equipment and associated accessories
- D. Delivery of radio system equipment and associated accessories including hand portable
- E. Receipt of on board radio equipment by Rolling Stock Contractor at site in Nagpur
- F. Delivery of CCTV system and associated accessories
- G. Delivery of EPABX and direct line telephone network, digital voice recorder and associated accessories
- H. Delivery of Access Control and Intrusion Detection System and associated accessories
- I. Delivery of T-SCADA system and associated accessories
- J. Delivery of optic fibre cable and associated accessories.
- K. Delivery of telephone cable and associated accessories
- L. Delivery of equipment & accessories.
- M. Any other item(s) considered necessary to comply with Scope of Work

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Reach 2 COST CENTRE No. B: Manufacture & Delivery

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	<p>Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ____” from the Engineer after:</p> <ul style="list-style-type: none"> - Issue of Inspection Certificate on satisfactory completion of all Factory Tests / running - Marine Insurance - Documents for shipment to Indian Port - Transit insurance from Port in India to Depot Site in Nagpur. - Material Inspection at Depot / Warehouse - Delivery of equipment at Contractor’s premises in Nagpur. <p>For:</p>			
1	Delivery of PAS Equipment and associated accessories			
2	Delivery of PIDS equipment and associated accessories			
3	Delivery of FOTS, Networking, master clock system and CSS equipment and associated accessories			
4	Delivery of EPABX and direct line telephone network, digital voice recorder and associated accessories			
5	Delivery of radio system central control equipment, base station(s), antennae, antennae supporting structure, radio control/workstations/access units and associated accessories			
6	Delivery of hand portable radios and associated accessories			
7	Receipt of on board radio equipment, radio control head and associated accessories for the Rolling Stock Contractor			
8	Delivery of CCTV and associated accessories			
9	Delivery of optic fibre cable and associated accessories			
10	Delivery of Access Control and Intrusion Detection System and associated accessories			
11	Delivery of telecom, power & data cables and associated accessories at contractor’s premises in Nagpur.			
12	Delivery of Telecom SCADA System and associated accessories for backup OCC			
13	Any Other Item to Complete the scope of work			
	COST CENTRE TOTAL			

Notes: It is certified that ‘Annexure-1’ annexed in Technical Package is a “TRUE COPY” (with prices blanked off) of the said ‘Annexure-1’ annexed in the Financial Package.

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

3.3 Reach 2 COST CENTRE No. C: Installation, Site Testing

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.

This includes but is not limited to:

TELECOMMUNICATIONS SYSTEM

- A. Indoor Equipment:** Shifting from Contractor's premises in Nagpur to Site, installation and testing of all equipment including FOTS, clocks, CDRS, RADIO, telephone system, radio system, PAS, CCTV system, PIDS, T SCADA and associated servers hardware & accessories:
- Site preparations
 - Complete fixing and wiring of indoor equipment in accordance with circuit and installation diagrams.
 - **Post installation tests including** Pre-power up checking, power up customization and configuration of equipment
- B. Outdoor Equipment:** Shifting to Site from Contractor's premises in Nagpur, installation and testing of all equipment including optical fibre cable, telephone cables, clocks, telephones, Radio Tower & Equipment and associated equipment, CCTV monitors, cameras and associated equipment, PIDS display boards including erection of junction boxes, wiring and terminations etc.
- Receipt of equipment at Site, pre-installation tests, inspection of equipment and Site preparations.
 - Complete fixing and wiring of equipment in accordance with circuit and installation diagrams.
 - **Post installation tests including Pre-power up checking, power up, customization and configuration of equipment**
- C. Perform Partial Acceptance Tests in accordance with the accepted PAT Plan for Telecommunications.
- D. Onboard Equipment:**
- Completion of Installation and testing of all on-board equipment for train-radio and their associated accessories in 5 train set, as certified jointly in writing, by the Contractor and Rolling Stock Contractor for the satisfactory installation and testing of the on-board equipment.
 - Submit certificate jointly signed by the N1TL01 Contractor and Rolling Stock Contractor for the satisfactory testing of the on-board equipment.

Any other item(s) considered necessary to comply with the Scope of Works

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Reach 2- COST CENTRE No. C: Installation, Site Testing

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ---“ from the Employer’s Representative for:			
1	Shifting from Contractor’s Premises in Nagpur to Site, installation and testing (includes pre-installation tests, post installation tests and PAT for all sub-systems) of all indoor equipment such as FOTS, networking, clocks, CSS, telephone system, radio system, PAS, CCTV system, PIDS, etc and associated accessories.			
2	Shifting from Contractor’s Premises in Nagpur to Site. Installation and testing (includes pre installation tests, post installation tests and PAT for all sub-systems) of all outdoor equipment such as FOTS, Networking, clocks and CSS, telephone system, radio system, PAS, CCTV system and PIDS, etc and associated accessories			
3	Obtain as above for Back up OCC, Metro Bhavan, Depot & RSS			
4	Provision and Installation and testing of Train Radio Tower(s)			
5	Completion of Partial Acceptance Tests for Telecommunication systems.			
6	Testing & Commissioning Documents			
7	Any other item(s) considered necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

3.4 Reach 2 - COST CENTRE No. D: Integrated Testing and Commissioning

<p>This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.</p> <p>This shall include but not be limited to:</p> <ul style="list-style-type: none"> A. System Acceptance Tests in accordance with the accepted SAT Plan for Telecommunications B. Integrated testing and commissioning documents C. Integrated Testing and Commissioning D. Service Trials, System Safety Case of the Telecommunication Systems. E. Complete configuration software backup data for all subsystems including section, trains, depot, OCC. F. As built Drawings <p>Any other item(s) considered necessary to comply with the Scope of Work</p>
--

Reach 2- COST CENTRE No. D: System Acceptance Test, Integrated Testing and Commissioning

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ---“ from the Employer’s Representative for			
1	Completion of System Acceptance Tests			
2	Completion of Integrated Testing & Commissioning .			
3	Completion of Service Trials.			
4	Completion of integration of Telecom with system of other designated contractors.			
5	Complete configuration software backup data for all subsystems including section, trains, and Backup OCC			
6	Submission of As built drawings.			
7	System Safety Case for Telecom system.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

3.5 Reach 2 - SECTION MS - (MISCELLANEOUS)

COST CENTRE No. E – Training

<p>This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.</p> <p>This shall include but not be limited to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Provision of Instructors by the Contractor for training of operating and maintenance personnel of the Employer in India <input type="checkbox"/> Training of operating and maintenance personnel of the Employer offshore at the OEM’s premises and Metro. <p style="text-align: center;">Any other item(s) considered necessary to comply with the Scope of Work.</p>
--

Notes: The travel boarding and lodging expenses for the Employer’s trainees sent overseas shall be borne by the Employer.

Reach 2 SECTION MS - (MISCELLANEOUS)

COST CENTRE E – Training

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ---“ from the Employer’s Representative for:			
1	Training of Employer’s personnel (75 man-days) overseas in OEMs premises and Metro. (Number of Trainees as per employer’s discretion)			
2	Provision of Contractor’s Instructors (20 days) for training of Employer’s Operating & Maintenance personnel in India. (Number of Trainees as per employer’s discretion)			
3	Submission of Training Manuals (Original plus two hard copies) and in electronic format.			
4	Any other item(s) necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

3.6 Reach 2 COST CENTRE No. F (MISCELLANEOUS): Spares, Special Tools, Testing Equipment and Measuring Instrument

<p>1. This Cost Centre comprises all those obligations and ongoing activities throughout the</p> <p>2. Contract not associated directly with any other Cost Centre. This shall include but not be limited to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Supply of Spares for Telecommunication systems. <input type="checkbox"/> Supply of special tools and equipment, testing and measuring instruments <input type="checkbox"/> Any other item(s) considered necessary by the Contractor to comply with the Scope of Work.
--

Reach 2 COST CENTRE No. F (MISCELLANEOUS): Spares, Special Tools, Testing Equipment and Measuring Instrument

Milestone No.	Work Description	Foreign Currency	Indian Rupees	Weeks from Commencement Date
	Milestone Activity	Column A	Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for delivery of the following in accordance with the Work's Requirements:			
1	Delivery of spares			
2	Delivery of special tools Testing Equipment and Measuring Instrument.			
3	Any other item(s) considered necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

3.7 Reach 2 COST CENTRE No. G (MISCELLANEOUS): Supervision Of Maintenance & DLP Support

This Cost Centre comprises supervision of maintenance of Telecommunication systems:

- The Contractor shall provide experts for supervision of maintenance in accordance with the Work's Requirements
- Defect Liability Support (DLP support.)

Notes: The deployment of the experts under this Cost Centre may not be continuous and they may be required to supervise the maintenance in short periods at a time. The number of days of experts shall, however, not less than 750 man-days for the Reach 2. Payment for this Cost Centre will be made on man-month basis.

Reach 2 COST CENTRE No. G (MISCELLANEOUS): Supervision of Maintenance & DLP Support

Milestone No.	Work Description	Foreign Currency	Indian Rupees	Total Cost of Supervision of Maintenance & DLP Support
	Milestone Activity	Column A	Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for completion of the following in accordance with the Work's Requirements:			
1	Supervision of Maintenance			
2	DLP Support.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

4. Reach -3

4.1 Reach 3- COST CENTRE No. A: Plans & Design Document

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre. This Cost Centre includes but is not limited to:

- A. Contractor's Project Plan, Document Submission Procedure, Design Documents Submission, Health, Safety & Environment Plans (SHE), Interface Management Plan with Designated Contractors.
- B. Works Programme and Document Submission Programme.
 - Project Management Plans and other Plans as per document list.
 - EMC Management Plan
 - RAMS Plans
 - Software Quality Assurance Plan
 - Quality Plan
 - System Verification & Validation Plan
 - System Assurance Plans.
 - Furnishing of training manuals and associated materials.
 - Others
- C. Preliminary System Design for Telecommunication Systems, consisting of:
 - System and Sub-System Overview and preliminary design.
 - System requirement specification, System traceability specification, Design Verification Table.
 - Detailed Design and Configuration Details
 - Detailed Interface Design Document
 - Installation Drawings and Documents
 - Tests Plans
 - Train to Wayside bidirectional communication scheme plan.
 - Specifications for Indoor and Line side Equipments including the requirement for power,
 - Space and preliminary mounting details for main line and depot.
 - Layout plan for equipment and cables in OCC, Backup OCC Depot,
 - Layout plan for equipment and cables for UPS system for Telecommunication.
 - Any other item(s) considered necessary to comply with the Scope of Work.

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Reach 3-COST CENTRE No. A: Plans & Design Document

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ____” from the Engineer for:			
1	Contractor’s Project Plan, Document Submission Programme, Safety, Health & Environment Plans and other Plans			
2	Preliminary System design for Telecommunication System System Block Diagram.			
3	Earthing, Lightning and Surge Protection Plan			
4	Specifications for Indoor and Line side Equipments including the requirement for power, space and preliminary mounting details for main line and depots			
5	Layout plan for equipment and cables in OCC, & Depot, station & Layout plan for equipment and cables for UPS system for Telecom			
6	Interface Management Plan with Designated Contractors			
7	List of Materials required and Delivery Schedule thereof			
8	Detailed Interface Documents with the Designated Contractors			
9	Final Design/Application Engineering for Telecommunication systems.			
10	Final drawings for the accepted Final Design for Telecommunication systems.			
11	Application/ Configuration Documents/Drawings for stations, OCC, Backup OCC, Depot and main lines			
12	Factory Acceptance Test Plans and Type Test Plans including planning, methodology and checklists			
13	Any other item(s) considered necessary to comply with Scope of Work			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

4.2 Reach 3 -COST CENTRE No. B: Manufacture and Delivery

This Cost Centre comprises all those obligations and on-going activities throughout the Contract not associated directly with any other Cost Centre.

This includes but is not limited to:

Receipt /delivery of following equipment after type test, factory acceptance test, and proof of Insurance at Contractor's premises in Nagpur:

TELECOMMUNICATION SYSTEM

- A. Delivery of PA system and associated accessories.
- B. Delivery of PIDS and associated accessories
- C. Delivery of FOTS, networking, master clock system & equipment and associated accessories
- D. Delivery of radio system equipment and associated accessories including hand portable
- E. Receipt of on board radio equipment by Rolling Stock Contractor at site in Nagpur
- F. Delivery of CCTV system and associated accessories
- G. Delivery of EPABX and direct line telephone network, digital voice recorder and associated accessories
- H. Delivery of Access Control and Intrusion Detection System and associated accessories
- I. Delivery of T-SCADA system and associated accessories
- J. Delivery of optic fibre cable and associated accessories.
- K. Delivery of telephone cable and associated accessories
- L. Delivery of equipment & accessories for OCC & Depot.
- M. Any other item(s) considered necessary to comply with Scope of Work

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Reach 3 COST CENTRE No. B: Manufacture, and Delivery

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ____” from the Engineer after: - Issue of Inspection Certificate on satisfactory completion of all Factory Tests / running - Marine Insurance - Documents for shipment to Indian Port - Transit insurance from Port in India to Depot Site in Nagpur. - Material Inspection at Depot / Warehouse - Delivery of equipment at Contractor’s premises in Nagpur. for:			
1	Delivery of PAS Equipment and associated accessories			
2	Delivery of PIDS equipment and associated accessories			
3	Delivery of FOTS, Networking, master clock system and CSS equipment and associated accessories			
4	Delivery of EPABX and direct line telephone network, digital voice recorder and associated accessories			
5	Delivery of radio system central control equipment, base station(s), antennae, antennae supporting structure, radio control/workstations/access units and associated accessories			
6	Delivery of hand portable radios and associated accessories			
7	Receipt of on board radio equipment, radio control head and associated accessories for the Rolling Stock Contractor			
8	Delivery of CCTV and associated accessories			
9	Delivery of optic fibre cable and associated accessories			
10	Delivery of Access Control and Intrusion Detection System and associated accessories			
11	Delivery of telecom, power & data cables and associated accessories at contractor’s premises in Nagpur.			
12	Delivery of OCC equipment and associated accessories for Telecom at Contractors premises in Nagpur			
13	Delivery of Depot equipment and associated accessories			
14	Delivery of Telecom SCADA System and associated accessories for OCC			
15	Any other item(s) considered necessary to comply with Scope of Work.			
	COST CENTRE TOTAL			

Notes: It is certified that ‘Annexure-1’ annexed in Technical Package is a “TRUE COPY” (with prices blanked off) of the said ‘Annexure-1’ annexed in the Financial Package.

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

4.3 Reach 3 COST CENTRE No. C: Installation, Site Testing

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.

This includes but is not limited to:

TELECOMMUNICATIONS SYSTEM

- A. Indoor Equipment:** Shifting from Contractor's premises in Nagpur to Site, installation and testing of all equipment including FOTS, clocks, CDRS, RADIO, telephone system, radio system, PAS, CCTV system, PIDS, T SCADA and associated servers hardware & accessories:
- Site preparations
 - Complete fixing and wiring of indoor equipment in accordance with circuit and installation diagrams.
 - **Post installation tests including** Pre-power up checking, power up customization and configuration of equipment
- B. Outdoor Equipment:** Shifting to Site from Contractor's premises in Nagpur, installation and testing of all equipment including optical fibre cable, telephone cables, clocks, telephones, Radio Tower & Equipment, loudspeakers and associated equipment, CCTV monitors, cameras and associated equipment, PIDS display boards including erection of junction boxes, wiring and terminations etc.
- Receipt of equipment at Site, pre-installation tests, inspection of equipment and Site preparations.
 - Complete fixing and wiring of equipment in accordance with circuit and installation diagrams.
 - **Post installation tests including Pre-power up checking, power up, customization and configuration of equipment**
- C. Perform Partial Acceptance Tests in accordance with the accepted PAT Plan for Telecommunications.
- D. Onboard Equipment:**
- Completion of Installation and testing of all on-board equipment for train-radio and their associated accessories in 5 train set, as certified jointly in writing, by the Contractor and Rolling Stock Contractor for the satisfactory installation and testing of the on-board equipment.
 - Submit certificate jointly signed by the N1TL01 Contractor and Rolling Stock Contractor for the satisfactory testing of the on-board equipment.

Any other item(s) considered necessary to comply with the Scope of Works

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Reach 3- COST CENTRE No. C: Installation, Site Testing

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for:			
1	Shifting from Contractor's Premises in Nagpur to Site, installation and testing (includes pre-installation tests, post installation tests and PAT for all sub-systems) of all indoor equipment such as FOTS, networking, clocks, CSS, telephone system, radio system, PAS, CCTV system, PIDS, etc and associated accessories.			
2	Shifting from Contractor's Premises in Nagpur to Site. Installation and testing (includes pre installation tests, post installation tests and PAT for all sub-systems) of all outdoor equipment such as FOTS, Networking, clocks and CSS, telephone system, radio system, PAS, CCTV system and PIDS, etc and associated accessories			
3	Obtain as above for OCC & Depot			
4	Provision and Installation and testing of Train Radio Tower(s)			
5	Completion of Partial Acceptance Tests for Telecommunication systems.			
6	Testing & Commissioning Documents			
7	Any other item(s) considered necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

4.4 Reach 3 - COST CENTRE No. D: System Acceptance Test, Integrated Testing and Commissioning

<p>This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.</p> <p>This shall include but not be limited to:</p> <ul style="list-style-type: none"> A. System Acceptance Tests in accordance with the accepted SAT Plan for Telecommunications B. Integrated testing and commissioning documents C. Integrated Testing and Commissioning D. Service Trials, System Safety Case of the Telecommunication Systems. E. Complete configuration software backup data for all subsystems including section, trains, depot, OCC. F. As built Drawings G. Any other item(s) considered necessary to comply with the Scope of Work.
--

Reach 3 - COST CENTRE No. D: System Acceptance Test, Integrated Testing and Commissioning

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for			
1	Completion of System Acceptance Tests			
2	Completion of Integrated Testing & Commissioning .			
3	Completion of Service Trials.			
4	Completion of integration of Telecom with system of other designated contractors.			
5	Complete configuration software backup data for all subsystems including section, trains, depot and OCC			
6	Submission of As built drawings.			
7	System Safety Case for Telecom system.			
8	Any other item(s) considered necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

4.5 Reach 3 - SECTION MS - (MISCELLANEOUS)

COST CENTRE No. E – Training

<p>This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.</p> <p>This shall include but not be limited to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Provision of Instructors by the Contractor for training of operating and maintenance personnel of the Employer in India <input type="checkbox"/> Training of operating and maintenance personnel of the Employer offshore at the OEM's premises and Metro . <p style="text-align: center;">Any other item(s) considered necessary to comply with the Scope of Work.</p>

Notes: The travel boarding and lodging expenses for the Employer's trainees sent overseas shall be borne by the Employer.

Reach 3 SECTION MS - (MISCELLANEOUS)

COST CENTRE E – Training

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency Column A	Indian Rupees Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for:			
1	Training of Employer's personnel (75 man-days) overseas in OEMs premises and Metro. (Number of Trainees as per employer's discretion)			
2	Provision of Contractor's Instructors (20 days) for training of Employer's Operating & Maintenance personnel in India. (Number of Trainees as per employer's discretion)			
3	Submission of Training Manuals (Original plus two hard copies) and in electronic format.			
4	Any other item(s) necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

4.6 Reach 3 COST CENTRE No. F (MISCELLANEOUS): Spares, Special Tools, Testing Equipment and Measuring Instrument

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.

This shall include but not be limited to:

- Supply of Spares for Telecommunication systems.
- Supply of special tools and equipment, testing and measuring instruments
- Any other item(s) considered necessary by the Contractor to comply with the Scope of Work.

Reach 3 COST CENTRE No. F (MISCELLANEOUS): Spares, Special Tools, Testing Equipment and Measuring Instrument

Milestone No.	Work Description	Foreign Currency	Indian Rupees	Weeks from Commencement
	Milestone Activity	Column A	Column B	Date
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for delivery of the following in accordance with the Work's Requirements:			
1	Delivery of spares			
2	Delivery of special tools Testing Equipment and Measuring Instrument.			
3	Any other item(s) considered necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

4.7 Reach 3 COST CENTRE No. G (MISCELLANEOUS): Supervision Of Maintenance and DLP Support

This Cost Centre comprises supervision of maintenance of Telecommunication systems:

- The Contractor shall provide experts for supervision of maintenance in accordance with the Work's Requirements
- Defect Liability Support (DLP support.)

Notes: The deployment of the experts under this Cost Centre may not be continuous and they may be required to supervise the maintenance in short periods at a time. The number of days of experts shall, however, not less than 750 man-days for the Reach 3. Payment for this Cost Centre will be made on man-month basis.

Reach 3 COST CENTRE No. G (MISCELLANEOUS): Supervision Of Maintenance and DLP Support

Milestone No.	Work Description	Foreign Currency	Indian Rupees	Total Cost of Supervision of Maintenance & DLP Support
	Milestone Activity	Column A	Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to - --" from the Employer's Representative for completion of the following in accordance with the Work's Requirements:			
1	Supervision of Maintenance			
2	DLP Support.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

5. Reach -4

5.1 Reach 4- COST CENTRE No. A: Plans & Design Document

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre. This Cost Centre includes but is not limited to:

- A. Contractor's Project Plan, Document Submission Procedure, Design Documents Submission, Health, Safety & Environment Plans (SHE), Interface Management Plan with Designated Contractors.
- B. Works Programme and Document Submission Programme.
 - Project Management Plans and other Plans as per document list.
 - EMC Management Plan
 - RAMS Plans
 - Software Quality Assurance Plan
 - Quality Plan
 - System Verification & Validation Plan
 - System Assurance Plans.
 - Furnishing of training manuals and associated materials.
 - Others
- C. Preliminary System Design for Telecommunication Systems, consisting of:
 - System and Sub-System Overview and preliminary design.
 - System requirement specification, System traceability specification, Design Verification Table.
 - Detailed Design and Configuration Details
 - Detailed Interface Design Document
 - Installation Drawings and Documents
 - Tests Plans
 - Train to Wayside bidirectional communication scheme plan.
 - Specifications for Indoor and Line side Equipments including the requirement for power,
 - Space and preliminary mounting details for main line and depot.
 - Layout plan for equipment and cables for UPS system for Telecommunication.
 - Any other item(s) considered necessary to comply with the Scope of Work.

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Reach 4-COST CENTRE No. A: Plans & Design Document

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ____” from the Engineer for:			
1	Contractor’s Project Plan, Document Submission Programme, Safety, Health & Environment Plans and other Plans			
2	Preliminary System design for Telecommunication System System Block Diagram.			
3	Earthing, Lightning and Surge Protection Plan			
4	Specifications for Indoor and Line side Equipments including the requirement for power, space and preliminary mounting details for main line and depots			
5	Layout plan for equipment and cables & UPS distribution panel for stations			
6	Interface Management Plan with Designated Contractors			
7	List of Materials required and Delivery Schedule thereof			
8	Detailed Interface Documents with the Designated Contractors			
9	Final Design/Application Engineering for Telecommunication systems.			
10	Final drawings for the accepted Final Design for Telecommunication systems.			
11	Application/ Configuration Documents/Drawings for stations, OCC, Backup OCC, Depot and main lines			
12	Factory Acceptance Test Plans and Type Test Plans including planning, methodology and checklists			
13	Any other item(s) considered necessary to comply with Scope of Work			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

5.2 Reach 4 -COST CENTRE No. B: Manufacture and Delivery

This Cost Centre comprises all those obligations and on-going activities throughout the Contract not associated directly with any other Cost Centre.

This includes but is not limited to:

Receipt /delivery of following equipment after type test, factory acceptance test, and proof of Insurance at Contractor's premises in Nagpur:

TELECOMMUNICATION SYSTEM

- A. Delivery of PA system and associated accessories.
- B. Delivery of PIDS and associated accessories
- C. Delivery of FOTS, networking, master clock system & equipment and associated accessories
- D. Delivery of radio system equipment and associated accessories including hand portable
- E. Receipt of on board radio equipment by Rolling Stock Contractor at site in Nagpur
- F. Delivery of CCTV system and associated accessories
- G. Delivery of EPABX and direct line telephone network, digital voice recorder and associated accessories
- H. Delivery of Access Control and Intrusion Detection System and associated accessories
- I. Delivery of T-SCADA system and associated accessories
- J. Delivery of optic fibre cable and associated accessories.
- K. Delivery of telephone cable and associated accessories
- L. Any other item(s) considered necessary to comply with Scope of Work

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Reach 4 COST CENTRE No. B: Manufacture, and Delivery

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ____” from the Engineer after: - Issue of Inspection Certificate on satisfactory completion of all Factory Tests / running - Marine Insurance - Documents for shipment to Indian Port - Transit insurance from Port in India to Depot Site in Nagpur. - Material Inspection at Depot / Warehouse - Delivery of equipment at Contractor’s premises in Nagpur. for:			
1	Delivery of PAS Equipment and associated accessories			
2	Delivery of PIDS equipment and associated accessories			
3	Delivery of FOTS, Networking, master clock system and CSS equipment and associated accessories			
4	Delivery of EPABX and direct line telephone network, digital voice recorder and associated accessories			
5	Delivery of radio system central control equipment, base station(s), antennae, antennae supporting structure, radio control/workstations/access units and associated accessories			
6	Delivery of hand portable radios and associated accessories			
7	Receipt of on board radio equipment, radio control head and associated accessories for the Rolling Stock Contractor			
8	Delivery of CCTV and associated accessories			
9	Delivery of optic fibre cable and associated accessories			
10	Delivery of Access Control and Intrusion Detection System and associated accessories			
11	Delivery of telecom, power & data cables and associated accessories at contractor’s premises in Nagpur.			
12	Any other item(s) considered necessary to comply with Scope of Work.			
	COST CENTRE TOTAL			

Notes: It is certified that ‘Annexure-1’ annexed in Technical Package is a “TRUE COPY” (with prices blanked off) of the said ‘Annexure-1’ annexed in the Financial Package.

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

5.3 Reach 4 COST CENTRE No. C: Installation, Site Testing

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.

This includes but is not limited to:

TELECOMMUNICATIONS SYSTEM

- A. Indoor Equipment:** Shifting from Contractor's premises in Nagpur to Site, installation and testing of all equipment including FOTS, clocks, CDRS, RADIO, telephone system, radio system, PAS, CCTV system, PIDS, T SCADA and associated servers hardware & accessories:
- Site preparations
 - Complete fixing and wiring of indoor equipment in accordance with circuit and installation diagrams.
 - **Post installation tests including** Pre-power up checking, power up customization and configuration of equipment
- B. Outdoor Equipment:** Shifting to Site from Contractor's premises in Nagpur, installation and testing of all equipment including optical fibre cable, telephone cables, clocks, telephones, Radio Tower & Equipment, loudspeakers and associated equipment, CCTV monitors, cameras and associated equipment, PIDS display boards including erection of junction boxes, wiring and terminations etc.
- Receipt of equipment at Site, pre-installation tests, inspection of equipment and Site preparations.
 - Complete fixing and wiring of equipment in accordance with circuit and installation diagrams.
 - **Post installation tests including Pre-power up checking, power up, customization and configuration of equipment**
- C. Perform Partial Acceptance Tests in accordance with the accepted PAT Plan for Telecommunications.
- D. Onboard Equipment:**
- Completion of Installation and testing of all on-board equipment for train-radio and their associated accessories in 5 train set, as certified jointly in writing, by the Contractor and Rolling Stock Contractor for the satisfactory installation and testing of the on-board equipment.
 - Submit certificate jointly signed by the N1TL01 Contractor and Rolling Stock Contractor for the satisfactory testing of the on-board equipment.

Any other item(s) considered necessary to comply with the Scope of Works

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Reach 4- COST CENTRE No. C: Installation, Site Testing

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the “Notice of No Objection” or “Notice of No Objection Subject to ---“ from the Employer’s Representative for:			
1	Shifting from Contractor’s Premises in Nagpur to Site, installation and testing (includes pre-installation tests, post installation tests and PAT for all sub-systems) of all indoor equipment such as FOTS, networking, clocks, CSS, telephone system, radio system, PAS, CCTV system, PIDS, etc and associated accessories.			
2	Shifting from Contractor’s Premises in Nagpur to Site. Installation and testing (includes pre installation tests, post installation tests and PAT for all sub-systems) of all outdoor equipment such as FOTS, Networking, clocks and CSS, telephone system, radio system, PAS, CCTV system and PIDS, etc and associated accessories			
3	Obtain as above for OCC & Depot			
4	Provision and Installation and testing of Train Radio Tower(s)			
5	Completion of Partial Acceptance Tests for Telecommunication systems.			
6	Testing & Commissioning Documents			
7	Any other item(s) considered necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

5.4 Reach 4 - COST CENTRE No. D: System Acceptance Test, Integrated Testing and Commissioning

<p>This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.</p> <p>This shall include but not be limited to:</p> <ul style="list-style-type: none"> A. System Acceptance Tests in accordance with the accepted SAT Plan for Telecommunications B. Integrated testing and commissioning documents C. Integrated Testing and Commissioning D. Service Trials, System Safety Case of the Telecommunication Systems. E. Complete configuration software backup data for all subsystems including section, trains, depot, OCC, back up OCC. F. As built Drawings G. Any other item(s) considered necessary to comply with the Scope of Work.

Reach 4 - COST CENTRE No. D: System Acceptance Test, Integrated Testing and Commissioning

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency	Indian Rupees	
	Milestone Activity	Column A	Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for			
1	Completion of System Acceptance Tests			
2	Completion of Integrated Testing & Commissioning .			
3	Completion of Service Trials.			
4	Completion of integration of Telecom with system of other designated contractors.			
5	Complete configuration software backup data for all subsystems including section, trains, depot and OCC , Back up OCC			
6	Submission of As built drawings.			
7	System Safety Case for Telecom system.			
8	Any other item(s) considered necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

5.5 Reach 4 - SECTION MS - (MISCELLANEOUS)

COST CENTRE No. E – Training

<p>This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.</p> <p>This shall include but not be limited to:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Provision of Instructors by the Contractor for training of operating and maintenance personnel of the Employer in India <input type="checkbox"/> Training of operating and maintenance personnel of the Employer offshore at the OEM's premises and Metro . <p style="text-align: center;">Any other item(s) considered necessary to comply with the Scope of Work.</p>

Notes: The travel boarding and lodging expenses for the Employer's trainees sent overseas shall be borne by the Employer.

Reach 4 SECTION MS - (MISCELLANEOUS)

COST CENTRE E – Training

Milestone No.	Work Description	Apportioned Amount		Weeks for completion of Milestone from Commencement Date
		Foreign Currency Column A	Indian Rupees Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for:			
1	Training of Employer's personnel (75 man-days) overseas in OEMs premises and Metro. (Number of Trainees as per employer's discretion)			
2	Provision of Contractor's Instructors (20 days) for training of Employer's Operating & Maintenance personnel in India. (Number of Trainees as per employer's discretion)			
3	Submission of Training Manuals (Original plus two hard copies) and in electronic format.			
4	Any other item(s) necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

5.6 Reach 4 COST CENTRE No. F (MISCELLANEOUS): Spares, Special Tools, Testing Equipment and Measuring Instrument

This Cost Centre comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Cost Centre.

This shall include but not be limited to:

- Supply of Spares for Telecommunication systems.
- Supply of special tools and equipment, testing and measuring instruments
- Any other item(s) considered necessary by the Contractor to comply with the Scope of Work.

Reach 4 COST CENTRE No. F (MISCELLANEOUS): Spares, Special Tools, Testing Equipment and Measuring Instrument

Milestone No.	Work Description	Foreign Currency	Indian Rupees	Weeks from Commencement
	Milestone Activity	Column A	Column B	Date
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Employer's Representative for delivery of the following in accordance with the Work's Requirements:			
1	Delivery of spares			
2	Delivery of special tools Testing Equipment and Measuring Instrument.			
3	Any other item(s) considered necessary to comply with the Scope of Work.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

5.7 Reach 4 COST CENTRE No. G (MISCELLANEOUS): Supervision Of Maintenance and DLP Support

This Cost Centre comprises supervision of maintenance of Telecommunication systems:

- The Contractor shall provide experts for supervision of maintenance in accordance with the Work's Requirements
- Defect Liability Support (DLP support.)

Notes: The deployment of the experts under this Cost Centre may not be continuous and they may be required to supervise the maintenance in short periods at a time. The number of days of experts shall, however, not less than 750 man-days for the Reach 4. Payment for this Cost Centre will be made on man-month basis.

Reach 4 COST CENTRE No. G (MISCELLANEOUS): Supervision Of Maintenance and DLP Support

Milestone No.	Work Description	Foreign Currency	Indian Rupees	Total Cost of Supervision of Maintenance & DLP Support
	Milestone Activity	Column A	Column B	
	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to - --" from the Employer's Representative for completion of the following in accordance with the Work's Requirements:			
1	Supervision of Maintenance			
2	DLP Support.			
	COST CENTRE TOTAL			

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

APPENDIX 1: BILL OF QUANTITIES FOR N1TL01/2016
(THIS DOCUMENT IS TO BE PREPARED AND COMPLETED BY THE BIDDER)
(Bill of Quantities to be proposed by Bidder along with the cost therein)

S. No	SYSTEM	Foreign Currency (FC)	Indian Rupee (INR)
1	PAS/PID System		
2	Master Clock System		
3	CDRS		
4	Radio System		
5	Telephone		
6	CCTV System		
7	FOTS and Networking System (WAN)		
8	ACIDS		
9	T-SCADA System (As Optional Item)		
10	Spares, Special Tools, Testing Equipment and Measuring Instrument		
11	Total		

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

1. Minimum BOQ for PAS/PIDS System

S.N	Item Description	Unit	Qty	Unit Rate		Total	
				FC	LC	FC	LC
A1	Plans & Design Document						
1	Application Engineering, Design, Layout and Documentations	LS	LS				
2	Interface Application Engineering and design with designated DDC, Construction Contractor of station, Traction, Depot, Etc.	LS	LS				
3	As built Drawings as per General Specification and Technical Specification	LS	LS				
4	Any other Item to comply the TS requirement	LS	LS				
A1	Schedule Total for Schedule A1						
B1	Manufacture & Delivery						
1	PAS/PIDS Server (Fully Configured in Redundant RAID configuration) and Interface at OCC & BCC	No	2				
2	NMS with workstation for PAS/PIDS at OCC / BCC	No	2				
3	PAS/PIDS Integrated Workstation MMI with MIC including back up PA Console & Mic and KVM and other accessories for stations.	No	72				
4	PAS/PIDS Integrated Workstation with MIC including PA Console back up Paging Station, KVM and accessories for OCC / BCC	No	12				
5	PAS/PIDS Integrated Workstation with MIC including PA Console back up Paging Station, KVM and accessories for Depot	No	4				
6	Station PAS/PIDS Server with redundancy at Stations /OCC/BCC	No	84				
7	IP VOICE ALARM ROUTER MATRIX , Zone Controller with Network Interface	No	84				
8	PAS Amplifier Mainframe Chassis	No	188				
9	PAS Amplifier 100-500W as per design, Bidder shall quote for each type of Amplifier as per design.	No	350				
10	Dual Line Surveillance Interface with End of Line Register and other accessories	No	336				
11	Standby Line Surveillance Interface	No	88				
12	Interface with Digital & Analogue Expansion Unit	No	88				
13	Ambient Noise Sensor with IP 66 Box	No	336				
14	Operating System , Software & Licenses	LS	LS				
15	CEILING LOUDSPEAKER	No	4000				
16	Wall Mount Speaker	No					
17	Column LOUDSPEAKER	No					
18	Projector LOUDSPEAKER	No					
19	Outdoor Horn Loudspeaker	No					
Note	For item No 15 to 19 Bidder shall quote quantity for each type of speaker as per the design						

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

S.N	Item Description	Unit	Qty	Unit Rate		Total	
				FC	LC	FC	LC
20	LIFT LOUDSPEAKER -	No	176				
21	PA Outdoor Cable Fire Survival LSZH	LS	LS				
22	PA Indoor Cable Fire Survival LSZH	LS	LS				
23	Noise Sensor Cable	LS	LS				
24	Fire Interface Cable	LS	LS				
25	Double Sided platform Backlit TFT/ LED Backlit LCD Full HD Panel with redundant CPU, POWER , Network card board) for Platform	No	152				
26	Single Sided platform Backlit TFT/ LED Backlit LCD Full HD Panel with redundant CPU, POWER , Network card board) for Stations & HQ	No	156				
27	Double Sided Concourse Display Board (Backlit LCD/ LED Full HD Panel with redundant CPU, POWER , Network card board) for Stations	No	76				
28	Power & Data SPD	LS	LS				
29	Software , OS , Licenses	LS	LS				
30	PIDS Power Cable (unarmoured) - Fire Retardant type with low smoke zero halogen – (Km)	LS	LS				
31	PIDS Data Cable (unarmoured) - Fire Retardant type with low smoke zero halogen – (Km)	LS	LS				
32	Cable Trays, GI . PVC LSZH Conduit as per specifications (Km)	LS	LS				
33	Notebook loaded with all required software/licenses	No	04				
34	Supply and Delivery of Site Material (Racks, Distribution Boards, DDF, ODF, IDF, connectors, connecting cables, HDPE, Gang Box, Fixture etc.) for complete Installation / Testing / Commissioning of PAS/PIDS System	LS	LS				
35	CAT 6e STP cable , connectors and other Data Cables and patch cords	LS	LS				
36	Any Other Item necessary for meeting fully the Contract Requirements	LS	LS				
B1	Total Cost of Schedule B1						
C1	Installation, Site Testing						
1	Testing & Commissioning	LS	LS				
C1	Total Cost of Schedule C1						
D1	System Acceptance Test, Integrated Testing and Commissioning						
1	System Acceptance Test, Integrated Testing and Commissioning	LS	LS				
D1	Total Cost of Schedule D1						
E1	Training						
1	Offshore training	Man days	LS				
2	Training Instructor for training at NMRCL	Man days	LS				
E1	Total Cost of Schedule E1						
F1	Spares, Special Tools, Testing Equipment and Measuring Instrument						
1	Spares	LS	LS				
2	Special Tools, Testing Equipment and Measuring	LS	LS				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

S.N	Item Description	Unit	Qty	Unit Rate		Total	
				FC	LC	FC	LC
	Instrument						
3	Equipment for Integrated test facility	LS	LS				
F1	Total Cost of Schedule F1						
G1	Supervision Of Maintenance and DLP Support						
1	Supervision of Maintenance	Man days					
2	DLP Support	Month	24				
G1	Total Cost of Schedule G1						
	Total Cost for Schedule 1 (PAS/PIDS) (A1+B1+C1+D1+E1+F1+G1)						

Note

1. Total price quoted in the BOQs should be unit price multiplied by the total quoted quantity.
2. Bidder may give further breakup of item, if considered necessary.
3. Minimum BOQ have been indicated the pricing schedule, Bidder need to work out the quantity as per proposed solution complying the TS requirement. However irrespective of design at least minimum quantity needs to be proposed by the Bidder. Any additional items or enhancement of any quantity to complete the scope of work shall be borne by the N1TL01 Contractor.
4. Above Quantities are indicative and minimum. Final quantities for supply shall be based on detailed design as functional requirement.
5. Wherever Lump Sum (LS) Quantity is indicated, quantities for the same needs to be estimated and quoted by the Bidder.
6. Minimum Combined BOQ for all sub system under schedule F (Spares, Special Tools, Testing Equipment and Measuring Instrument) is given in schedule No 9, Bidder shall quote the cost for PAS/PID considering the same.
7. Bidder shall quote the Rates for each equipment separately as per design while maintaining the overall minimum BOQ.
8. In case, Virtual server solution is proposed by bidder then minimum BOQ for servers/workstations shall be submitted by bidder as per design, whereas design shall be approved by NMRCL. & During the POC or detailed design stage, if any additional servers/workstations shall be required then it is responsibility of N1 TL01 contractor to implement the solution accordingly without any variation in cost.

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

2. BOQ for Master Clock System

S. No.	Item Description	Unit	Qty	Unit Rate		Total	
				FC	LC	FC	LC
A2	Plans & Design Document	LS	LS				
1	Application Engineering, Design, Layout and Documentations	LS	LS				
2	Interface Application Engineering and design with designated DDC, Construction Contractor of station, Traction, Depot, Etc.	LS	LS				
3	As built Drawings as per General Specification and Technical Specification	LS	LS				
4	Any other Item to comply the TS requirement	LS	LS				
A2	Schedule Total for Schedule A2						
B2	Manufacture & Delivery						
1	NMS , Central Master Clock with GPS antenna with dual control , power and functional Boards	No.	02				
2	Station-Sub-Master Clock(if required as per design)	No.	42				
3	Analog Clock Double Sided IP 66	No.	150				
4	Digital Indoor Clock – IP 54	No.	400				
5	Analogue Outdoor Clock 8 feet – IP66	No.	36				
6	Power Cable (un-armoured) - Fire Retardant Low smoke/low halogen	Km	LS				
7	Power Cable (armoured) – Fire Retardant Low smoke/low halogen	Km	LS				
8	Data Cable (un-armoured) (Km) - Fire Retardant Low smoke/low halogen	Km	LS				
9	Data Cable (armoured) – Fire Retardant Low smoke/low halogen	Km	LS				
10	Earth cable - Fire Retardant type with low smoke/low halogen -	Km	LS				
11	Supply and Delivery of Site Material (Racks, DDF, connectors, connecting cables, Gang Box, Cable trays etc.) for complete Installation , Testing & Commissioning of Clock System	LS	LS				
12	GI Conduit / PVC LSZH / Secondary Containment as per specifications	Km	LS				
13	Surge Arrestor Devices and accessories .	No	LS				
14	Any other item required to meet contract requirement	LS	LS				
B2	Total Cost of Schedule B2						
C2	Installation, Site Testing						
1	Testing & Commissioning	LS	LS				
C2	Total Cost of Schedule C2						
D2	System Acceptance Test, Integrated Testing and Commissioning						
1	System Acceptance Test, Integrated Testing and Commissioning	LS	LS				
D2	Total Cost of Schedule D2						
E2	Training						
1	Offshore training	Man Days	LS				
2	Training Instructor for training at NMRCL	Man Days	LS				
E2	Total Cost of Schedule E2						
F2	Spares, Special Tools, Testing Equipment and Measuring Instrument						
1	Spares	LS	LS				
2	Special Tools, Testing Equipment and Measuring Instrument	LS	LS				
3	Equipment for Integrated test facility	LS	LS				
	Total Cost of Schedule F2						

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

G2	Supervision Of Maintenance and DLP Support						
1	Supervision of Maintenance	Man Days					
2	DLP Support	Month s	24				
	Total Cost of Schedule G2						
	Total Cost for Schedule 2 (MCK) (A2+B2+C2+D2+E2+F2+G2)						

Note

1. Total price quoted in the BOQs should be unit price multiplied by the total quoted quantity.
2. Bidder may give further breakup of item, if considered necessary.
3. Minimum BOQ have been indicated the pricing schedule, Bidder need to work out the quantity as per proposed solution complying the TS requirement. However irrespective of design at least minimum quantity needs to be proposed by the Bidder. Any additional items or enhancement of any quantity to complete the scope of work shall be borne by the N1TL01 Contractor.
4. Above Quantities are indicative and minimum. Final quantities for supply shall be based on detailed design as functional requirement. In case further break up of Milestone is required ,Bidder to evaluate by self and propose price accordingly .
5. Wherever Lump Sum (LS) Quantity is indicated, quantities for the same needs to be estimated and quoted by the Bidder.
6. Minimum Combined BOQ for all sub system under schedule F (Spares, Special Tools, Testing Equipment and Measuring Instrument) is given in schedule No 9, Bidder shall quote the cost for PAS/PID considering the same.
7. In case, Virtual server solution is proposed by bidder then minimum BOQ for servers/workstations shall be submitted by bidder as per design, whereas design shall be approved by NMRCL. & During the POC or detailed design stage, if any additional servers/workstations shall be required then it is responsibility of N1 TL01 contractor to implement the solution accordingly without any variation in cost.

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

3. BOQ for CDRS System

S. No.	Item Description	Unit	Qty	Unit Rate		Total	
				FC	LC	FC	LC
	CDRS						
A3	Plans & Design Document	LS	LS				
1	Application Engineering, Design, Layout and Documentations	LS	LS				
2	Interface Application Engineering and design with designated DDC, Construction Contractor of station, Traction, Depot, Etc.	LS	LS				
3	As built Drawings as per General Specification and Technical Specification	LS	LS				
4	Any other Item to comply the TS requirement	LS	LS				
A3	Schedule Total for Schedule A3						
B3	Manufacture & Delivery						
5	Main Server , NMS and other control systems in redundancy	No.	02				
6	Main Logger	No.	04				
7	Pre Amplifiers	No.	LS				
8	Playback MMI with monitor + speakers	No.	04				
9	Free space record equipment & software	No.	40				
10	Mics. for free space recording	No.	LS				
11	External archiving facility	No.	04				
12	Radio / Telephone / PA Recording channel licenses	LS	LS				
13	E1 / PCM to Ethernet Interface	LS	LS				
14	Maintenance Laptop with all Software and NMS licenses	No.	04				
15	Any other item , software , interface to achieve functionality	LS	LS				
B3	Total Cost of Schedule B3						
C3	Installation, Site Testing						
1	Testing & Commissioning	LS	LS				
C3	Total Cost of Schedule C3						
D3	System Acceptance Test, Integrated Testing and Commissioning						
1	System Acceptance Test, Integrated Testing and Commissioning	LS	LS				
D3	Total Cost of Schedule D3						
E3	Training						
1	Offshore training	Man Days	LS				
2	Training Instructor for training at NMRCL	Man Days	LS				
	Total Cost of Schedule E3						
F3	Spares, Special Tools, Testing Equipment and Measuring Instrument						
1	Spares	LS	LS				
2	Special Tools, Testing Equipment and Measuring Instrument	LS	LS				
3	Equipment for Integrated test facility	LS	LS				
	Total Cost of Schedule F3						
G3	Supervision Of Maintenance and DLP Support						
1	Supervision of Maintenance	Man Days					
2	DLP Support	Mont hs	24				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

	Total Cost of Schedule G3						
	Total Cost for Schedule 3 (CDRS) (A3+B3+C3+D3+E3+F3+G3)						

Note

1. Total price quoted in the BOQs should be unit price multiplied by the total quoted quantity.
2. Bidder may give further breakup of item, if considered necessary.
3. Minimum BOQ have been indicated the pricing schedule, Bidder need to work out the quantity as per proposed solution complying the TS requirement. However irrespective of design at least minimum quantity needs to be proposed by the Bidder. Any additional items or enhancement of any quantity to complete the scope of work shall be borne by the N1TL01 Contractor.
4. Above Quantities are indicative and minimum. Final quantities for supply shall be based on detailed design as functional requirement. In case further break up of Milestone is required, Bidder to evaluate by self and propose price accordingly.
5. Wherever Lump Sum (LS) Quantity is indicated, quantities for the same needs to be estimated and quoted by the Bidder.
6. Minimum Combined BOQ for all sub system under schedule F (Spares, Special Tools, Testing Equipment and Measuring Instrument) is given in schedule No 9, Bidder shall quote the cost for CDRS considering the same.
7. In case, Virtual server solution is proposed by bidder then minimum BOQ for servers/workstations shall be submitted by bidder as per design, whereas design shall be approved by NMRCL. & During the POC or detailed design stage, if any additional servers/workstations shall be required then it is responsibility of N1 TL01 contractor to implement the solution accordingly without any variation in cost.

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

4. BOQ for Radio System

S. No	Item Description	Unit	Qty	Unit Rate		Total	
				FC	LC	FC	LC
A4	Plans & Design Document	LS	LS				
1	Application Engineering, Design, Layout and Documentations	LS	LS				
2	Interface Application Engineering and design with designated DDC, Construction Contractor of station, Traction, Depot, Etc.	LS	LS				
3	As built Drawings as per General Specification and Technical Specification	LS	LS				
4	Any other Item to comply the TS requirement	LS	LS				
A4	Total Cost of Schedule A4						
B4	Manufacture & Delivery						
1.	Radio Central Server, NMS and application sub system such as routers with redundancy. Including interface with CDRS	No	2				
2.	Radio Base Station (BTS) equipped with two Base Radios, redundant controllers	No	11				
3.	Radio Main switching Station equipped with redundant controllers	No	2				
4.	Panel / Omni Antenna system for outdoor BTS with 2 base radio	No	11				
5.	Antenna structure , Cable trays etc for outdoor radio base station with radio tower as per approved design.	No	11				
6.	Train Radio Control Panel with Power Supply + Antenna + Desktop interface, telephone handset	No	50				
7.	Radio Dispatcher Work station (RDW)	No	15				
8	RAU with Power Supply + Antenna + Desktop interface, telephone handset	No	60				
9.	Hand portable Radio with full function key model with LCD display + accessories + battery & charger for each	No	400				
10	Multi-Unit Charger for Hand held Radio Set	No	20				
11.	On board train radio complete with MMI, Train radio interfacing with Signaling, TIMS and PAS etc. to be mounted on RS & CMV	No.	50				
12.	NMS at OCC Including CDRS as per PS.	No.	02				
13.	a. AVLS	LS	LS				
	b. Coverage Planning tools	LS	LS				
	c. Field strength Meter/ Software.	LS	LS				
	d. Train borne Antenna system	Nos.	50				
14	Supply and Delivery of Site Material (Racks, Distribution Boards, DDF, , connectors, connecting cables, power cables,	LS	LS				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

	data cables, Leaky coaxial cable ancillary, installation accessories etc.) for complete installation/Testing/Commissioning of Radio System						
15	Maintenance Laptop with NMS licenses and software	No	4				
B4	Total Cost of Schedule B4						
C4	Installation, Site Testing						
1	Testing & Commissioning	LS	LS				
C4	Total Cost of Schedule C4						
D4	System Acceptance Test, Integrated Testing and Commissioning						
1	System Acceptance Test, Integrated Testing and Commissioning	LS	LS				
D4	Total Cost of Schedule D4						
E4	Training						
1	Offshore training	Man Days	LS				
2	Training Instructor for training at NMRCL	Man Days	LS				
	Total Cost of Schedule E4						
F4	Spares, Special Tools, Testing Equipment and Measuring Instrument						
1	Spares	LS	LS				
2	Special Tools, Testing Equipment and Measuring Instrument	LS	LS				
3	Equipment for Integrated test facility	LS	LS				
	Total Cost of Schedule F4						
G4	Supervision Of Maintenance and DLP Support						
1	Supervision of Maintenance	Man Days					
2	DLP Support	Months	24				
	Total Cost of Schedule G4						
	Total Cost for Schedule 4 (Radio) (A4+B4+C4+D4+E4+F4+G4)						

Note

- Total price quoted in the BOQs should be unit price multiplied by the total quoted quantity.**
- Bidder may give further breakup of item, if considered necessary.**
- Minimum BOQ have been indicated the pricing schedule, Bidder need to work out the quantity as per proposed solution complying the TS requirement. However irrespective of design at least minimum quantity needs to be proposed by the Bidder. Any additional items or enhancement of any quantity to complete the scope of work shall be borne by the N1TL01 Contractor.**
- Above Quantities are indicative and minimum. Final quantities for supply shall be based on detailed design as functional requirement. In case further break up of Milestone is required, Bidder to evaluate by self and propose price accordingly.**
- Wherever Lump Sum (LS) Quantity is indicated, quantities for the same needs to be estimated and quoted by the Bidder.**
- Minimum Combined BOQ for all sub system under schedule F (Spares, Special Tools, Testing Equipment and Measuring Instrument) is given in schedule No 9, Bidder shall quote the cost for Radio System considering the same.**
- In case, Virtual server solution is proposed by bidder then minimum BOQ for servers/workstations shall be submitted by bidder as per design, whereas design shall be approved by NMRCL. & During the POC or detailed design stage, if any additional servers/workstations shall be required then it is responsibility of N1 TL01 contractor to implement the solution accordingly without any variation in cost.**

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

5. BOQ of Telephone System

S. No	Item Description	Unit	Qty	Unit Rate		Total	
				LC	FC	LS	FC
A5	Plans & Design Document	LS	LS				
1	Application Engineering, Design, Layout and Documentations	LS	LS				
2	Interface Application Engineering and design with designated DDC, Construction Contractor of station, Traction, Depot, Etc.	LS	LS				
3	As built Drawings as per General Specification and Technical Specification	LS	LS				
4	Any other Item to comply the TS requirement	LS	LS				
A5	Total Cost of Schedule A5						
B5	Manufacture & Delivery						
1	IP PBX 512 ports equipped/ 1024 wired/ analog/digital card / Ethernet ports / as required (including NMS) for OCC.	No	2				
2	IP PBX 48 ports equipped/ 96 wired/ Ethernet ports as required (Stations)	No	40				
3	IP PBX 256 ports equipped/512 wired/ Ethernet ports as required (NMRCL HQ/ Depots)	No	3				
4	Direct Line Telephone - 20 Lines for SCR/DCC	No	40				
5	Direct Line Telephone - 10 Line in the Station/ depot/ Headquarter area (other than SCR)	No	142				
6	Direct Line Telephone Console at OCC 90 Lines capacity	No	25				
7	Direct Line Master Conference Set	No	25				
8	Basic phones with 20 % wired capacity	No	1120				
9	Digital Feature Phone	No	98				
10	PFCT	No	8				
11	IP PBX call server (hot standby) 250 Port equipped, 700 wired, Gateway, Gatekeeper, H.323, SIP, redundant Power etc.	No	1				
12	Help Points	No	152				
13	Voice IP Phone	No	118				
14	NMS for IP PBX and NETWORK Elements	No	2				
15	GI Pipe for Conduiting & Flexible	Km	LS				
16	Telephone Indoor & outdoor cable	Km	LS				
17	Rectifier , batteries & Charger	LS	LS				
18	Firm Ware , software & licenses	LS	LS				
19	Portable Notebook computers suitable for field maintenance/ configuration, testing of Telephone exchange at stations, OCC & loaded with all relevant software/Licenses..	No	7				
20	HDPE pipes (50mm OD)/ TEC approved (Km)	Km	LS				
21	Supply and Delivery of Site Material for (Racks, Cable Trays Base Frame, AC/DC Distribution Boards for all Telecom Systems, MDF, IDF, Surge Protection Box, connectors, connecting cables, power cables, data cables, Gang Box, Face Plate etc.) for complete Installation/ Testing/ Commissioning of Telephone System.	LS	LS				
22	Delivery any other item necessary for meeting fully the contract requirements.	LS	LS				
	Total Cost for Schedule B5						

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

C5	Installation, Site Testing						
1	Testing & Commissioning	LS	LS				
C5	Total Cost of Schedule C5						
D5	System Acceptance Test, Integrated Testing and Commissioning						
1	System Acceptance Test, Integrated Testing and Commissioning	LS	LS				
D5	Total Cost of Schedule D5						
E5	Training						
1	Offshore training	Man days	LS				
2	Training Instructor for training at NMRCL	Man days	LS				
E5	Total Cost of Schedule E5						
F5	Spares, Special Tools, Testing Equipment and Measuring Instrument						
1	Spares	LS	LS				
2	Special Tools, Testing Equipment and Measuring Instrument	LS	LS				
3	Equipment for Integrated test facility	LS	LS				
	Total Cost of Schedule F5						
G5	Supervision Of Maintenance and DLP Support						
1	Supervision of Maintenance	Man days					
2	DLP Support	Months	24				
	Total Cost of Schedule G5						
	Total Cost for Schedule 5 (Radio) (A5+B5+C5+D5+E5+F5+G5)						

Note

- Total price quoted in the BOQs should be unit price multiplied by the total quoted quantity.**
- Bidder may give further breakup of item, if considered necessary.**
- Minimum BOQ have been indicated the pricing schedule, Bidder need to work out the quantity as per proposed solution complying the TS requirement. However irrespective of design at least minimum quantity needs to be proposed by the Bidder. Any additional items or enhancement of any quantity to complete the scope of work shall be borne by the NITL01 Contractor.**
- Above Quantities are indicative and minimum. Final quantities for supply shall be based on detailed design as functional requirement. In case further break up of Milestone is required, Bidder to evaluate by self and propose price accordingly.**
- Wherever Lump Sum (LS) Quantity is indicated, quantities for the same needs to be estimated and quoted by the Bidder.**
- Minimum Combined BOQ for all sub system under schedule F (Spares, Special Tools, Testing Equipment and Measuring Instrument) is given in schedule No 9, Bidder shall quote the cost for Telephone considering the same.**
- In case, Virtual server solution is proposed by bidder then minimum BOQ for servers/workstations shall be submitted by bidder as per design, whereas design shall be approved by NMRCL. & During the POC or detailed design stage, if any additional servers/workstations shall be required then it is responsibility of N1 TL01 contractor to implement the solution accordingly without any variation in cost.**

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

6. Minimum BOQ for CCTV System

Sr. No.	Description	Unit	Qty	Unit Price		Total Price	
				FC	LC	FC	LC
A6	Plans & Design Document						
1	Application Engineering, Design, Layout and Documentations	LS	LS				
2	Interface Application Engineering and design with designated DDC, Construction Contractor of station, Traction, Depot, Etc.	LS	LS				
3	As built Drawings as per General Specification and Technical Specification	LS	LS				
4	Any other Item to comply the TS requirement	LS	LS				
A6	Schedule Total for Schedule A 6						
B6	Manufacture & Delivery						
1	IP Fixed HD Cameras with all associated accessories including Varifocal lenses,, mounting etc. as per specifications.	No	1900				
2	Vandal proof Housing With bracket -IP 66 for Box camera.	No	1820				
3	Housing Outdoor (IP 66) with Bracket	No	80				
4	Mini Dome Camera with recess mounting Kit.	No	280				
5a	PTZ Camera / 360 Degree View Outdoor/ Indoor with accessories (IP 66)	No	172				
5b	PTZ/Fixed Camera for viaduct with accessories (IP 66)	No	72				
6	Lift IP Cam Mini dome with fixed lens	No	164				
7	Optical to Ethernet Converter - As per Design	No	316				
8	Infra-Red Light projector 200m range + bracket for mounting	No.	188				
9	NVR Server with RAID 5 to record all cameras of each station (including RSS if any) /OCC/ Backup OCC/Depot/HQ as per specification complete with all hardware/ software/licenses etc.	No	42				
10	central Server with complete Hardware/Software with one Color Laser Printer and all associated accessories for central management.	No	2				
11	Licenses for Cameras, Workstations and Keyboards (For item 1,2,3,4 and 5 above)	LS	LS				
12	Local Work Station (MMI with two monitors each, for Monitoring at Stations/depots Security Room/ SCR's	No	80				
13	Local Work Station (MMI with one monitor each, for OCC/BCC Controllers including Security Controllers/ incidence Management Room at OCC/BCC etc)	No	20				
14	Keyboard with joystick for CCTV with all accessories as per specification	LS	LS				
	KVM TX/RX Pair complete(for 2 Monitors, 1	LS					

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

15	Keyboard, 1 Mouse and 1 Joystick keyboard) with all AC- AC Converter accessories as per specifications		LS				
16	Unarmored 3 Core Power Cable as per specifications	KM	LS				
17	Armored 3 Core Power Cable as per Specifications	Km	LS				
18	Cat 6e STP LSLH / LSZH or better unarmored cable as per Specifications	LS	LS				
19	Cat 6e STP or better armored cable as per specifications	LS	LS				
20	Armored 12 Fibre OF Cable as per specifications	LS	LS				
21	HDPE Telecom Duct (40/33mm) as per TEC Characteristics	LS	LS				
22	GI Conduit as per specifications	LS	LS				
23	Cable Trays , GI Flexible conduit as per specifications	LS	LS				
24	19" 42 U Equipment Racks (minimum 1 no. per TER/CER has been assumed, tenderer shall indicate actual quantity required and cost for same) as per specifications	No	38				
25	Surge Protection Devices for each power and each data circuit termination at both device and equipment ends as per specifications	LS	LS				
26	Flexible PVC LSZH & Secondary containment conduits	LS	LS				
27	Primary & Secondary Fixtures	LS	LS				
28	Video Analytics and Intrusion Detection at Stations	LS	LS				
29	Laptops with all necessary software and licenses for maintenance.	No	7				
30	Miscellaneous Items to meet the above requirement	LS	LS				
B6	Total for Schedule B6						
C6	Installation, Site Testing						
1	Testing & Commissioning	LS	LS				
C6	Total Cost of Schedule C5						
D6	System Acceptance Test, Integrated Testing and Commissioning						
1	System Acceptance Test, Integrated Testing and Commissioning	LS	LS				
D6	Total Cost of Schedule D6						
E6	Training						
1	Offshore training	Man days	LS				
2	Training Instructor for training at NMRCL	Man days	LS				
E6	Total Cost of Schedule E6						
F6	Spares, Special Tools, Testing Equipment and Measuring Instrument						
1	Spares	LS	LS				
2	Special Tools, Testing Equipment and Measuring Instrument	LS	LS				
3	Equipment for Integrated test facility	LS	LS				
F6	Total Cost of Schedule F6						
G6	Supervision Of Maintenance and DLP Support						
1	Supervision of Maintenance	Man	24				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

		days					
2	DLP Support	Months	24				
	Total Cost of Schedule G6						
	Total Cost for Schedule 6 (Radio) (A6+B6+C6+D6+E6+F6+G6)						

Note

1. Total price quoted in the BOQs should be unit price multiplied by the total quoted quantity.
2. Bidder may give further breakup of item, if considered necessary.
3. Minimum BOQ have been indicated the pricing schedule, Bidder need to work out the quantity as per proposed solution complying the TS requirement. However irrespective of design at least minimum quantity needs to be proposed by the Bidder. Any additional items or enhancement of any quantity to complete the scope of work shall be borne by the N1TL01 Contractor.
4. Above Quantities are indicative and minimum. Final quantities for supply shall be based on detailed design as functional requirement. In case further break up of Milestone is required ,Bidder to evaluate by self and propose price accordingly .
5. Wherever Lump Sum (LS) Quantity is indicated, quantities for the same needs to be estimated and quoted by the Bidder.
6. Minimum Combined BOQ for all sub system under schedule F (Spares, Special Tools, Testing Equipment and Measuring Instrument) is given in schedule No 9, Bidder shall quote the cost for CCTV considering the same.
7. In case, Virtual server solution is proposed by bidder then minimum BOQ for servers/workstations shall be submitted by bidder as per design, whereas design shall be approved by NMRCL. & During the POC or detailed design stage, if any additional servers/workstations shall be required then it is responsibility of N1 TL01 contractor to implement the solution accordingly without any variation in cost.

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

7 BOQ of FOTS and Networking System (WAN)

Sr. No.	Unit	Qty	Unit Price		Total Price	
			FC	LC	FC	LC
A7	Plans & Design Document					
1	Application Engineering, Design, Layout and Documentations	LS	LS			
2	Interface Application Engineering and design with designated DDC, Construction Contractor of station, Traction, Depot, Etc.	LS	LS			
3	As built Drawings as per General Specification and Technical Specification	LS	LS			
4	Any other Item to comply the TS requirement	LS	LS			
A7	Total for Schedule A7					
B7	Manufacture & Delivery					
1	Layer 3 24 Port switch , stack module and associated accessories for stations/Depot/OCC	No	84			
2	Layer 2 switch – 24 Port Non POE and associated accessories for stations/Depot/OCC	No	94			
3	Layer 2 Switch – 24 Port POE and associated accessories for stations/Depot/OCC as per TS	No	86			
4	Layer 2 Switch – Enterprise Grade Switch - 48 Port - Non POE & Accessories, stacking cables & modules.	No	14			
5	Layer 2 Switch –48 Port - POE & Accessories - stacking cables & modules	No	44			
6	Central Core Switch and associated Accessories for OCC as per TS	No	2			
7	Network Management System for Wide Area Network as per TS.	No	2			
8	144 Fibers Armored Cable for Section as per TS. –	Km	180			
9	24 Fibers Armored Cable between Depot TER – RSS /ASS for Section and intra building / stations connectivity.	Km	LS			
10	CAT 6 e STP /LSZH/LSLS Cable	Km	LS			
11	HDPE Telecom Duct (40/33mm) as per TEC Characteristics	Km	LS			
12	19" 42 U Rack	No	40			
13	Optical Distribution Frame, Digital Distribution Frame, Patch panel, Loop boxes for fibre, Power Cables, Data Cables, Pigtails, Optical Patch Cards, CAT 6e STP factory made Patch Cords Connectors, Terminations etc. as per PS for stations, OCC, depot, RSS, etc.	LS	LS			
14	Design, Supply & installation of Base frame and Secondary containment & cable trays, required risers for wall mount units in TER of stations/depot and under false floor cable trays in SCR	No	40			
15	Miscellaneous Items to meet the above	LS	LS			

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

	Requirement						
16	Laptops for Maintenance with all Necessary licenses and software including NMS license.	No	4				
17	Provision of 20 % extra wired Port FOTS over design quantity.	LS	LS				
18	Provision of 20 % extra wired Port OA&IT over design quantity.	LS	LS				
19	Provision of L3 & L2 Switch ports for IP PABX and associated cables, patch cords , DDF etc	LS	LS				
20	Any other item to achieve functionality as TS						
B7	Total for Schedule B7						
C7	Installation, Site Testing						
1	Testing & Commissioning	LS	LS				
C7	Total Cost of Schedule C7						
D7	System Acceptance Test, Integrated Testing and Commissioning						
1	System Acceptance Test, Integrated Testing and Commissioning	LS	LS				
	Total Cost of Schedule D7						
E7	Training						
1	Offshore training	Man days	LS				
2	Training Instructor for training at NMRCL	Man days	LS				
E7	Total Cost of Schedule E7						
F7	Spares, Special Tools, Testing Equipment and Measuring Instrument						
1	Spares	LS	LS				
2	Special Tools, Testing Equipment and Measuring Instrument	LS	LS				
3	Equipment for Integrated test facility	LS	LS				
	Total Cost of Schedule F7						
G7	Supervision Of Maintenance and DLP Support						
1	Supervision of Maintenance	Man days					
2	DLP Support	Months	24				
G7	Total Cost of Schedule G7						
	Total Cost for Schedule 7 (FOTS & OA&IT) (A7+B7+C7+D7+E7+F7+G7)						

Note

- Total price quoted in the BOQs should be unit price multiplied by the total quoted quantity.**
- Bidder may give further breakup of item, if considered necessary.**
- Minimum BOQ have been indicated in the pricing schedule, Bidder need to work out the quantity as per proposed solution complying the TS requirement. However irrespective of design at least minimum quantity needs to be proposed by the Bidder. Any additional items or enhancement of any quantity to complete the scope of work shall be borne by the NITL01 Contractor.**
- Above Quantities are indicative and minimum. Final quantities for supply shall be based on detailed design as functional requirement. In case further break up of Milestone is required, Bidder to evaluate by self and propose price accordingly.**
- Wherever Lump Sum (LS) Quantity is indicated, quantities for the same needs to be estimated and quoted by the Bidder.**

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

- 6. Minimum Combined BOQ for all sub system under schedule F (Spares, Special Tools, Testing Equipment and Measuring Instrument) is given in schedule No 9, Bidder shall quote the cost for FOTS & OAIT System considering the same.**
- 7. In case, Virtual server solution is proposed by bidder then minimum BOQ for servers/workstations shall be submitted by bidder as per design, whereas design shall be approved by NMRCL. & During the POC or detailed design stage, if any additional servers/workstations shall be required then it is responsibility of N1 TL01 contractor to implement the solution accordingly without any variation in cost.**

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

8. BOQ for ACIDS

S. No.	Item Description	Unit	Qty	Unit Rate		Total	
				FC	LC	FC	LC
A8	Plans & Design Document						
1	Application Engineering, Design, Layout and Documentations	LS	LS				
2	Interface Application Engineering and design with designated DDC, Construction Contractor of station, Traction, Depot, Etc.	LS	LS				
3	As built Drawings as per General Specification and Technical Specification	LS	LS				
4	Any other Item to comply the TS requirement	LS	LS				
A8	Total for Schedule A8						
B8	Manufacture & Delivery						
1	Access Control Unit comprising IP Entry Card Reader, Magnetic Lock , Break Glass , Door Sensor and Exit Push Button for Stations	No	540				
2	Access Control Unit comprising IP Entry Card Reader, Magnetic Lock , Break Glass , Door Sensor and Exit Push Button for OCC and Backup OCC	No	80				
3	Access Control Unit comprising IP Entry Card Reader, Magnetic Lock , Break Glass , Door Sensor and Exit Push Button for Depot	No	28				
4	Access Control Unit comprising Entry Card Reader, Magnetic Lock and Exit Push Button for RSS	No	16				
5	Access Control Unit comprising IP Entry Card Reader, Magnetic Lock , Break Glass , Door Sensor and Exit Push Button for Metro Bhavan /HQ	No	10				
6	Biometrics Reader	No	54				
7	Smart Card Printer	No	6				
8	Central Server , Data Base , licenses	No	2				
9	Card Issue Work Station	No	4				
10	Cable – Data & Control Cable - LSLH	LS	LS				
11	Cable – Power Armored	Km	LS				
12	Cable – Power Unarmored	Km	LS				
13	Cable Trays , Secondary Containment, GI , PVC Conduits .	LS	LS				
14	Photographic Camera with stand	No	6				
15	Boom Barrier 3.5 meters with induction loop cable .	No	08				
16	Interface modules with AFC/CCTV and other systems	LS	LS				
17	Maintenance Laptop with NMS and other software	No	4				
18	Central Server with NMS at OCC & BCC	No	2				
19	Depot Perimeter Intrusion Detection System						
20	Any Other Item necessary for meeting fully the Contract Requirements	LS	LS				
B8	Total Cost of Schedule B8						
C8	Installation, Site Testing						
1	Testing & Commissioning	LS	LS				
C8	Total Cost of Schedule C8						
D8	System Acceptance Test, Integrated Testing and Commissioning						
1	System Acceptance Test, Integrated Testing and Commissioning	LS	LS				
D8	Total Cost of Schedule D8						
E8	Training						

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

1	Offshore training	Man Days	LS				
2	Training Instructor for training at NMRCL	Man days	LS				
E8	Total Cost of Schedule E8						
F8	Spares, Special Tools, Testing Equipment and Measuring Instrument						
1	Spares	LS	LS				
2	Special Tools, Testing Equipment and Measuring Instrument	LS	LS				
3	Equipment for Integrated test facility	LS	LS				
F8	Total Cost of Schedule F8						
G8	Supervision Of Maintenance and DLP Support						
1	Supervision of Maintenance	Man days					
2	DLP Support	Months	24				
G8	Total Cost of Schedule G8						
	Total Cost for Schedule 8 (ACID) (A8+B8+C8+D8+E8+F8+G8)						

Note

1. Total price quoted in the BOQs should be unit price multiplied by the total quoted quantity.
2. Bidder may give further breakup of item, if considered necessary.
3. Minimum BOQ have been indicated the pricing schedule, Bidder need to work out the quantity as per proposed solution complying the TS requirement. However irrespective of design at least minimum quantity needs to be proposed by the Bidder. Any additional items or enhancement of any quantity to complete the scope of work shall be borne by the N1TL01 Contractor.
4. Above Quantities are indicative and minimum. Final quantities for supply shall be based on detailed design as functional requirement. In case further break up of Milestone is required, Bidder to evaluate by self and propose price accordingly.
5. Wherever Lump Sum (LS) Quantity is indicated, quantities for the same needs to be estimated and quoted by the Bidder.
6. Minimum Combined BOQ for all sub system under schedule F (Spares, Special Tools, Testing Equipment and Measuring Instrument) is given in schedule No 9, Bidder shall quote the cost for ACID considering the same.
7. In case, Virtual server solution is proposed by bidder then minimum BOQ for servers/workstations shall be submitted by bidder as per design, whereas design shall be approved by NMRCL. & During the POC or detailed design stage, if any additional servers/workstations shall be required then it is responsibility of N1 TL01 contractor to implement the solution accordingly without any variation in cost.

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

9. BOQ for T SCADA (Optional Item)

S. No.	Item Description	Unit	Qty	Unit Rate		Total	
				FC	LC	FC	LC
A9	Plans & Design Document						
1	Application Engineering, Design, Layout and Documentations	LS	LS				
2	Interface Application Engineering and design with designated DDC, Construction Contractor of station, Traction, Depot, Etc.	LS	LS				
3	As built Drawings as per General Specification and Technical Specification	LS	LS				
4	Any other Item to comply the TS requirement	LS	LS				
A9	Schedule Total for Schedule A9						
B9	Manufacture & Delivery						
5	Telecom SCADA NMS, Central Server in redundancy System with required software and licenses	No.	02				
6	T- SCADA MMI with required software and licenses	No.	04				
7	Any Other Item necessary for meeting fully the Contract Requirements		LS				
B9	Total Cost of Schedule B 9						
C9	Installation, Site Testing						
1	Testing & Commissioning	LS	LS				
C9	Total Cost of Schedule C9						
D9	System Acceptance Test, Integrated Testing and Commissioning						
1	System Acceptance Test, Integrated Testing and Commissioning	LS	LS				
D9	Total Cost of Schedule D9						
E9	Training						
1	Offshore training	Man Days	LS				
2	Training Instructor for training at NMRCL	Man days	LS				
E9	Total Cost of Schedule E9						
F9	Spares, Special Tools, Testing Equipment and Measuring Instrument						
1	Spares	LS	LS				
2	Special Tools, Testing Equipment and Measuring Instrument	LS	LS				
3	Equipment for Integrated test facility	LS	LS				
F9	Total Cost of Schedule F9						
G9	Supervision Of Maintenance and DLP Support						
1	Supervision of Maintenance	Man Days	24				
2	DLP Support	Months	24				
G9	Total Cost of Schedule G9						
	Total Cost for Schedule 9 (TSCADA) (A9+B9+C9+D9+E9+F9+G9)						

Note

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

- 1. Total price quoted in the BOQs should be unit price multiplied by the total quoted quantity.**
- 2. Bidder may give further breakup of item, if considered necessary.**
- 3. Minimum BOQ have been indicated the pricing schedule, Bidder need to work out the quantity as per proposed solution complying the TS requirement. However irrespective of design at least minimum quantity needs to be proposed by the Bidder. Any additional items or enhancement of any quantity to complete the scope of work shall be borne by the N1TL01 Contractor.**
- 4. Above Quantities are indicative and minimum. Final quantities for supply shall be based on detailed design as functional requirement. In case further break up of Milestone is required, Bidder to evaluate by self and propose price accordingly.**
- 5. Wherever Lump Sum (LS) Quantity is indicated, quantities for the same needs to be estimated and quoted by the Bidder.**
- 6. Minimum Combined BOQ for all sub system under schedule F (Spares, Special Tools, Testing Equipment and Measuring Instrument) is given in schedule No 10, Bidder shall quote the cost for T-SCADA considering the same.**
- 7. Price for T-SCADA Shall be given as optional Item.**
- 8. In case, Virtual server solution is proposed by bidder then minimum BOQ for servers/workstations shall be submitted by bidder as per design, whereas design shall be approved by NMRCL. & During the POC or detailed design stage, if any additional servers/workstations shall be required then it is responsibility of N1 TL01 contractor to implement the solution accordingly without any variation in cost.**

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

10. Spares, Special Tools, Testing Equipment and Measuring Instrument

All items mentioned in the following tables is tentative and defined as minimum BOQ. This shall not be considered as exhaustive list of items and quantities. Bidder shall be responsible for evaluating detailed list and propose price accordingly.

Final list for spares, special tool, testing & measurement tolls shall be defined during detailed design stage.

a. Minimum BOQ for Spares

Sr. No.	Details	Unit	Qty	Unit Price		Total Price	
				FC	LC	FC	LC
PAS/PIDS Systems							
1	PIDS / PA Integrated workstations for station (workstation, monitor, mics, keyboard, mouse, speakers, headphones etc)	No.	5				
2.	All types of PCB cards including mother board and power supply unit of PIDS, PIDS Control, PIDS LED/LCD Displays (for platform LED Panels)	No.	10% of total QTY for each type				
3.	All types of PCB cards including mother board and power supply unit of PIDS, PIDS Control, PIDS LED/LCD Displays (for platform LED Panels)	No.	10% of total QTY for each type				
4.	PIDS Backlit LED/LCD displays double sided. Platform display board complete	No.	8				
5.	PIDS Backlit LED/LCD displays double sided Concourse display board complete	No.	8				
6	PIDS Backlit LED/LCD displays Single sided	No.	4				
7.	Complete PAS equipment cabinet including PA System control & Switching equipment	No.	2				
8	PA Control Panel	No.	3				
9	PA System Amplifier / Pre Amplifier	No.	10% of total QTY for each type				
10	PA Speakers All Types	No.	10% of total QTY for each type				
11	PA System noise sensing and feedback equipment	No.	10% of total QTY for each type				
Master clock system							
12	All replaceable module / cards for OCC Master Clock Unit as equipped in OCC	No.	1 no. each				
13	Station Sub Master Clock complete (with connecting cables and connectors	No.	3				
14	Indoor digital clocks	No.	24				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

15.	Analog Double sided station clocks	No.	9				
16.	Fuses of all types	No.	10% of total QTY for each type				
17.	Fuses / SPDs of all types	No.	10% of total QTY for each type				
18	Terminals of all types	No.	10% of total QTY for each type				
Radio							
1	On board train radio	No.	5				
2	Radio base station	No.	1				
3	Handheld portables	No.	25				
4	Radio access units	No.	5				
5	Radio control workstations	No.	3				
6	Radio control panel	No.	5				
7	Hand portable battery charger unit	No.	25				
8	Hand portable Multiple Unit Charger	No.	10				
9	Cards for switching NMS and Central Controller Units (Radio)	No.	10% of total QTY for each type				
10	Fuses for all types	No.	10% of total QTY for each type				
1 1	Terminals of all types	No.	10% of total QTY for each type				
12	All types of connectors / dummy loads	No.	10% of total QTY for each type				
	All types of replaceable / plug in	No.	10% of total QTY for each type				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

1 3	modules for centralized digital recording system						
1 4	Routers and switches used in the radio system	No.	10% of total QTY for each type				
Telephone							
1.	IP PBX fully equipped 48 port / 96 wired	No.	2 Nos.				
2.	IP PBX Server including Gateway (fully equipped)	No.	1 No				
3.	Exchange subscriber line cards	No.	10% of supplied qty for each type				
4.	Exchange junction line cards	No.	10% of supplied QTY for each type				
5.	Exchange system control cards	No.	10% of supplied QTY for each type				
6.	Direct line exchange cards	No.	10% of supplied qty for each type				
7.	Digital telephones	No.	20 no.				
8.	Analog telephones	No.	50 no.				
9.	Direct Line Telephones (each type)	No.	25 Nos.				
10	IP Phone (voice) with all accessories	No.	10 Nos.				
11.	Station Float cum boost charger (SMPS)	No.	One of each type				
12.	SMPS Module for 48 V System (SMR) (if required as per design)	No.	10% of supplied qty for each type				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

14.	Cards for FCBC	No.	10% of supplied qty for each type				
15.	Fuses for all types (for telephone and DC power system)	No.	10% of supplied qty for each type				
16.	Terminals of all types (for telephones and DC power System)	No.	10% of supplied qty for each type				
17.	CAT 6 cable each type	No.	1 km of each type				
18.	Telephone Cable Armoured - Multi Core	No.	2 km of each type				
19	Telephone Cable UnArmoured - Multi Core	No.	2 km of each type				
20	MDF / IDF Crone Modules of 10	No.	50				
CCTV							
1	Fixed IP cameras as per TS	No.	25				
2	Fixed dome type IP cameras as per TS	No.	5				
3	PTZ dome IP Cameras as per TS	No.	5				
4	IR Illuminated IP cameras as per TS	No.	5				
5	360 degree panoramic view camera	No.	5				
6	Local workstation (complete MMI with Two monitor for monitoring , cables & accessories) as per TS	No.	5				
7	Key board with joystick as per TS	No.	5				
8	NVR Server with RAID 5 or better each to record all cameras of each station as per TS	No.	5				
9	All type of replaceable / plug in modules for CCTV system	No.	10% of total population				
10	Protection devises for power, control and data circuits as per TS	No.	10 of each type				
11	Data cable CAT 5E (kms) as per TS	No.	2				
12	Power Cable (kms) as per TS	No.	1				
13	Optical fibre cable as per TS (kms)	No.	1				
14	KVM TX / RX pair and accessories.	No.	5				
15	Consumables for video Wall (e.g. light source, dust filter etc)	No.	10% of total population				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

FOTS - WAN							
1	Layer 3 switch , stack module and associated accessories for stations/Depot/OCC as per PS	No	09				
2	Layer 2 switch –24 Port Non POE and associated accessories for stations/Depot/OCC as per PS	No	09				
3	Layer 2 Switch – 24 Port POE and associated accessories for stations/Depot/OCC as per PS	No	05				
4	Layer 2 Switch –Switch – 8 Port – POE & Accessories , stacking cables & modules	No	09				
5	Layer 2 Switch –48 Port – POE & Accessories - stacking cables & modules	No	05				
6	Central Core Switch and associated accessories	No	1				
7	Firewall	No	1				
8	144 Fibres Armoured Cable for Section as per TS. –	Km	100				
09	24 Fibres Armoured Cable between Depot TER	Km	40				
10	CAT 6 e STP /LSZH/LS Patch Cords 2meters / 5 meters	Km	50				
11	HDPE Telecom Duct (40/33mm) as per TEC Characteristics	Km	10				
12	Terminal Connectors - each type	No	10				
13	ODF with splicing trays , connectors , sleeves etc .	No	05				
14	Optical Patch Cords , pigtails - All types	No	20 % of the supplied qty.				
ACCESS CONTROL & INTRUSION DETECTION SYSTEM							
1	Access Control Unit comprising IP Entry Card Reader, Magnetic Lock , Break Glass , Door Sensor and Exit Push	No	68				
2	Biometrics Reader	No.	6				
3	Smart Card Printer	No.	1				
4	Central Server , Data Base , licenses	LS	LS				
5	Card Issue Work Station Fully Configured	No	1				
6	Cable – Data & Control Cable - LSLH	KM	LS				
7	Cable – Power Armored	KM	LS				
8	Cable – Power Unarmored	KM	LS				
9	Boom Barrier 3.5 meters with induction loop cable .	Nos	01				
10	Depot Perimeter Intrusion Detection	Nos	LS				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

	System						
11	Any Other Item necessary for meeting fully the Contract Requirements	LS	10 % of the supplied Qty .				
Servers & Work Station MMI							
Unless specified in the Technical Specification , 10% of the supplied quantity as per approved configuration of Hardware .							
30 % OS , Software licenses , Firm ware licenses to be provided as spares as expansion capacity .							
1	Hardware Servers – HDD , Mother Board, RAM, SMPS , Mouse , Data Bus , Key boards , Mouse and other accessories	LS	10 % of ➤ The installed Configuration. ➤ Total Qty of the project.				
2	Hardware NVR – HDD , Mother Board, RAM, SMPS , Mouse , Data Bus , Key boards , Mouse and other accessories .	LS	10 % of ➤ The installed Configuration. Total Qty of the project.				
3	Hardware MMI – HDD , Mother Board, RAM, SMPS , Mouse , Data Bus , Key boards , Mouse and other accessories	LS	10 % of ➤ The installed Configuration. ➤ Total Qty of the project.				
4	OS , Software licenses , Firm ware licenses and others	LS	30% of ➤ The installed Configuration. ➤ Total Qty of the project.				

Note:

- (i) “Each type’ denotes the type actually provided during execution
- (ii) Spare quantity to be delivered per section should be rounded off to next higher integer.

b. Special tools & measuring instruments and Equipment for Integrated test facility

Sr. No.	(Supply)	Make	Unit	Qty	Unit Price		Total Price	
					FC	LC	FC	LC
1	AC POWER LINE ANALYSER	TEKTRONIX or Equivalent	Nos	1				
2	AC POWER LINE ANALYSER	BK PRECISION or	Nos	1				
3	EARTH TESTING KIT	BK PRECISION Equivalent	Nos	2				
4	INSULATION TESTERS (MEGGER – 500V DC)	Fluke or equivalent	Nos	2				
5	MULTIMETER - DIGITAL (HAND-HELD)	Fluke or equivalent	Nos	7				
6	MULTIMETER - DIGITAL (HIGH-PRECISION)	Fluke or equivalent	Nos	1				
7	MULTIMETER - ANALOG	Fluke or equivalent	Nos	5				
8	TONG TESTER	Fluke or equivalent	Nos	10				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Sr. No.	(Supply)	Make			Unit Price		Total Price	
9	HV TESTER	Fluke or equivalent	Nos	2				
10	OSCILLOSCOPE (100 MHZ) - DUAL TRACE	RIGOL or equivalent	Nos	2				
11	POWER SUPPLY (REGULATED) (+/-)0-30 VDC, 10A	Digimess or equivalent	Nos	3				
12	SOLDERING IRON (25W) ALONG WITH WIRE	Weller or equivalent		10				
13	SOLDERING IRON (50W) ALONG WITH WIRE	TENMA or equivalent	Nos	10				
14	IN-CIRCUIT IC TESTER	ABI or equivalent	Nos	3				
15	TRANSISTOR TESTER	Peak or equivalent	Nos	1				
16	VARIAC, SINGLE-PHASE 240V AC (5 KVA)	PureVolt or equivalent	Nos	2				
17	SMD station	Proskit or equivalent	Nos	1				
18	ESD tester	Vermason or equivalent	Nos	1				
19	Thermohygrometer	Fluke or equivalent	Nos	2				
20	CAT 6e screen cable spectrum analyser		Nos	2				
21	SPANNER SET	As approved	Nos	8				
22	TOOL KIT (SCREW DRIVERS, PLIERS, CRIMPING TOOL -J 45/11 ETC.)	As approved	Nos	10				
23	Hammer	As approved	Nos	10				
24	Audio		Nos	2				
25	ACOUSTIC LEVEL TEST SET (20HZ TO 20,000HZ)	NTI Audio or equivalent	Nos	3				
26	AF NOISE AND DISTORTION MEASURING SET (WITH SELECTIVE LEVEL MEASURING FACILITY)	Bedrock Audio or equivalent	Nos	3				
27	AUDIO SIGNAL GENERATOR	NTI Audio or equivalent	Nos	3				
28	ADAPTORS/BULLETS/PROBES AND ACCESSORIES	NTI Audio or equivalent	Nos	3				
29	SPL and STIPA Measurement Equipment	NTI Audio or equivalent	Nos					
30	CALIBRATED LIGHT SOURCE	ANRITSU or equivalent	Nos	3				
31	FUSION SPLICING MACHINE(WITH BUILT-IN MICROSCOPE)	INNO or equivalent	Nos	2				
32	PATCH CORDS - Optical SC-SC 2m	Polilan or equivalent	Nos	32				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Sr. No.	(Supply)	Make			Unit Price		Total Price	
33	TEST CORDS - CAT 6 2m	Polilan or equivalent	Nos	32				
34	Other Tests Cables	Fibrefab or equivalent	Nos	LS				
35	OPTICAL ADAPTORS	Fiberoptic.com or equivalent	Nos	64				
36	OPTICAL ATTENUATOR SET (INCLUDING VARIABLE OPTICAL ATTENUATOR)	ANRITSU or equivalent	Nos	8				
37	OPTICAL POWER & Source METER	JDSU or equivalent	Nos	5				
38	OPTICAL SPECTRUM ANALYZER	Optronics or equivalent KD Optics	Nos	1				
39	OPTICAL TALK SET	Optronics or equivalent KD Optics	Nos	2				
40	OTDR	VeEX or equivalent	Nos	5				
41	PIGTAILS (3M)	Fibrefab or equivalent	Nos	100				
42	STRAIGHT JOINT CLOSURES(FOR OF CABLE) COMPLETE WITH END BLOCKS, BUSHINGS, CLAMPS, STRENGTH MEMBERS, ETC.	Linx or equivalent	Nos	10				
43	OTDR Meter	Makita CK Tools or equivalent	Nos	2				
45	TOOL KIT FOR SPLICING, CUTTING TOOL & STRIPPER, PROTECTION SLEEVE HEATER, ETC.	Greenlee or equivalent	Nos	8				
46	RJ – 45/11	PROSKIT or equivalent	Nos	10				
47	CABLE FAULT LOCATOR	Fluke Networks or equivalent	Nos	4				
48	ETHERNET CABLE TESTER	Fluke Networks or equivalent	Nos	10				
49	NETWORK ANALYSER (LAN/WAN)	VeEX or equivalent	Nos	1				
50	DIGITAL SIGNAL GENERATOR	RIGOL or equivalent	Nos	3				
51	DIGITAL DISTORTION MEASURING SET	VeEX or equivalent	Nos	2				
52	DIGITAL EXCHANGE TEST SET FOR COMPREHENSIVE TEST AND MEASUREMENTS ON DIGITAL EXCHANGES COMPLETE WITH ALL	Elektronika or equivalent	Nos	2				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Sr. No.	(Supply)	Make			Unit Price	Total Price		
	ACCESSORIES							
53	Crimping Tools and Testing Cables	As Approved or equivalent	Nos					
54	LINE TESTING EQUIPMENT FOR SUBSCRIBER LINES AND TELEPHONE SETS	Fluke Networks or equivalent	Nos	4				
55	RF SIGNAL GENERATOR	Digimess or equivalent	Nos	2				
56	RF SWEEP OSCILLATOR	Aim-TTI or equivalent	Nos	2				
57	RADIO TEST SET COVERING ALL TRANS-RECEIVE PARAMETERS AS DETAILED IN THE TS	ANRITSU or equivalent	Nos	2				
58	RF COMMUNICATIONS TEST SET	RIGOL or equivalent	Nos	2				
59	SPECTRUM ANALYZER (RF) and Site Master	RIGOL or equivalent	Nos	2				
60	VSWR METER WITH DIRECTIONAL COUPLERS, ACCESSORIES, ETC.	Agilent / Keysight or equivalent	Nos	2				
61	DIRECTIONAL COUPLER	MINI CIRCUITS or equivalent	Nos	1				
62	DIRECTIONAL COUPLER	MINI CIRCUITS or equivalent	Nos	1				
63	ACCESSORIES FOR VSWR METER	ANRITSU or equivalent	Nos	2				
64	RF MILLI-VOLTMETER FOR VOLTAGE LEVEL AND POWER MEASUREMENTS	RIGOL or equivalent	Nos	2				
65	RF POWER METER WITH REFERENCE ATTENUATOR, SENSORS, ETC.(PORTABLE)	Agilent / Keysight or equivalent	Nos	4				
66	RF ATTENUATOR SET	MINI CIRCUITS or equivalent	Nos	3				
67	RF CABLES	ANRITSU or equivalent	Nos	3				
68	BNC crimping tool	Velleman	Nos	2				
69	RJ50 crimping tool	CNC Tech / GreenLee	Nos	2				
70	RJ50 crimping tool	CNC Tech / GreenLee	Nos	2				
71	Ferrule crimping tool	Knippex	Nos	2				
72	USB Serial adapter	RS	Nos	2				
73	Mobile programming cable	As approved	Nos	2				
74	Mobile programming cable	As approved	Nos	2				
75	FIELD STRENGTH/EMI METER WITH TEST ANTENNAE, TRIPODS, MASTS, CONNECTORS &	AARONIA or equivalent	Nos	1				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Sr. No.	(Supply)	Make			Unit Price		Total Price	
	ACCESSORIES							
76	CCTV, video							
77	VIDEO NOISE METER 40HZ – 10HZ	DSG Sistemas or equivalent	Nos	2				
78	VIDEO SIGNAL ANALYSER WITH PRINTER	DSG Sistemas or equivalent	Nos	2				
79	POE Injector and POE CCTV Handheld Monitor	Gefen	Nos	2				
80	VIDEO SIGNAL GENERATOR INCORPORATING FUNCTIONS OF VIDEO SIGNAL GENERATOR, NOISE GENERATOR ETC.	As approved or equivalent	Nos	2				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

c. Minimum BOQ for Integrated test Facility

S/No.	Material Description	Qty	Unit Price		Total Price	
			FC	LC	FC	LC
1	FOTS					
1.1	Layer 3 Switch 24 Port Non POE with accessories	2				
1.2	Layer 2 Switch 24 Port POE with accessories	2				
1.3	Optical Patch Cords and Cables	LS				
1.4	CAT 6e STP Patch Cords and Accessories	LS				
1.5	PATCH Panel	LS				
1.6	ODF - 48 Port with splicing Tray	2				
1.7	Fire Wall	1				
1.8	NMS Laptop	1				
2	OA&IT					
2.1	Layer 2 Switch 24 Port Non POE with accessories					
3	Sub Master Clock - As NTP Server	1				
4	PAS					
4.1	Amplifier Mainframe	1				
4.2	Amplifier Module 100 W	2				
4.3	Dual Line Surveillance Interface	2				
4.4	End of Line Resistor (10 pk)	2				
4.5	Control Matrix	1				
4.6	RS485 Interface Analogue and Digital I/O Expansion Unit	1				
4.7	Modular Paging Station Microphone 10 Button - Back up Console	1				
4.8	Noise Sensor	2				
4.9	Ceiling Loudspeaker	1				
4.10	PAS/PIDS Station Server with OS & Software	1				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

S/No.	Material Description	Qty	Unit Price		Total Price	
			FC	LC	FC	LC
4.11	TFT 22" Monitor and Speakers	1				
4.12	Projector Loudspeaker	1				
4.13	Loudspeaker cable 2*1,5 mm2 in Meters	50				
4.14	STP Cat6 Cable, Flame-Retardant or Heat Resistant, Low Smoke Zero Halogen in Meters	50				
5	PIDS					
5.1	Platform Display (LED/LCD Double face), with redundant Ctrl Board (MC + SC) and PSU	1				
5.2	Concourse Display (TFT Single face)	1				
6	Voice Recording					
6.2	Logger	1				
6.3	Storage device	1				
6.4	All Interface Unit	1				
6.5	Server	1				
7	CCTV					
7.1	Fixed Box Camera with housing	1				
7.2	PTZ outdoor	1				
7.3	Fixed Mini dom Camera	1				
7.4	MMI with Joystick with 22" Monitor	1				
7.5	NVR Server	1				
7.6	STP Cat6 Cable, Flame-Retardant or Heat Resistant, Low Smoke Zero Halogen in Meters	50				
7.7	Power Cable in meters	50				
8	Access Control					
8.1	IP Smart Card Reader (Door controller	1				
8.2	Door Contact (sensor) - Indoor	1				
8.3	I/O Box	1				

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

S/No.	Material Description	Qty	Unit Price		Total Price	
			FC	LC	FC	LC
8.4	Exit Button - Indoor	1				
8.5	Break-Glass Unit	1				
8.6	Override Key Switch (Per door)	1				
8.7	Magnetic Lock - Fail Open - Indoor	1				
8.8	Key Switch (at station exits)	1				
8.9	Power Supply Units	1				
8.10	Laptop for Maintenance purposes	1				
8.11	Data Cable in meters	50				
8.12	Power Cable in meters	50				
8.13	General Item					
8.14	Accessory for equipment fixing	LS				
8.15	19" 42 Racks with DIN Rail	4				
8.16	Terminal Blocks	LS				
8.17	Interface Relay	6				
9	Telephone					
9.1	IP PABX - 50 Line					
9.2	Portable PC	1				
9.3	DLT - 20 Lines	1				
9.4	Analogue Phone	2				
9.5	Digital Phone	2				
9.6	IP Phone	2				
9.7	MDF/IDF/Interface Cards/ Power Supply Units / Installation accessories	2				

Above BOQ shall be considered as Minimum BOQ not exhaustive. Bidder to include the qty in BOQ accordingly. Further details to be finalized during detailed design stage

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Annexure-2

MILESTONE PAYMENT SCHEDULE SHOWING MONTHLY CASH FLOWS FOR THE CONTRACT

This document to be prepared and completed as required by the Bidder and submitted as part of [Schedules'](#) under [Section IV: Bidding Forms](#).

1. The monthly cash flows shall be worked out as per the methodology indicated in relevant format under [Section IV: Bidding Forms](#).
2. The amount of [Cost Centre "E" of Section MS](#) and [Cost Centre "G" of Section MS](#) will not be included in the Monthly Cash Flows
3. It is certified that "[Annexure-4](#)" annexed in Technical Package is a "TRUE COPY" (with prices blanked off) of said "[Annexure-4](#)" in the Financial Package

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Annexure-3

LIST OF SPARES

1. We hereby confirm that we shall submit a schedule of spare parts duly indicating, for each item of spares, its description and number of units required for the system during the expected life and during the first ten years, principal source of supply, part number, drawing number, lead time, shelf life and the secondary source of supply within 96 weeks of Commencement date and the submission of these details shall be considered as a pre-requisite for accomplishment of Key Date as described in the relevant clause of the Employer's Requirement-General Specifications
2. It is certified that '[Annexure-4](#)' annexed in Technical Package is a "TRUE COPY" (with prices blanked off) of said [Annexure-4](#) in the financial package.

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Annexure-4

PRICING OF UNQUALIFIED WITHDRAWAL OF CONDITIONS, QUALIFICATIONS, DEVIATIONS ETC. SUBMITTED IN PRESCRIBED FORMAT UNDER **SECTION IV: BIDDING FORMS (FORM 4.12)**

Item	Condition, Qualification, Deviation etc.	Key date affected by each condition, qualification, deviation etc.	Increase or decrease for unqualified withdrawal of each conditions, qualification, deviation etc.			
			Foreign Currency	Indian Rupees	Cost Centre	Milestone No.
A	B	C	D	E	F	G

Notes:

1. In this Appendix, the Bidder shall indicate every key date that will be affected by each remark, comment, condition, qualification or deviation, etc. that has been specified in prescribed format under [Section IV: Bidding Forms \(Form 4.12\)](#) and prices for unqualified withdrawal of which has been quoted in this [Annexure-4](#).
2. Prices for unqualified withdrawal of each remark, comment, condition, qualifications or deviation, etc. that has been specified in prescribed format under [Section IV: Bidding Forms \(Form 4.12\)](#) shall be quoted in this [Annexure-4](#), clearly indicating the Cost Centre and Milestone No. to which it will be allocated. In case the Bidder does not indicate the Cost Centre and Milestone No., Employer will allocate the quoted price for withdrawal to the last Milestone under [Cost Centre G](#), which will be considered for amounts payable as per Milestone Payment Schedule. The 'Lump Sum Price' quoted by the Bidder in 'BID TOTAL' Page shall not include the Price for withdrawal of remark, comment, condition, qualifications or deviation etc quoted in this '[Annexure-4](#)'
3. In case price for unqualified withdrawal of any remark, comment, condition, qualification or deviation etc. indicated in prescribed format under [Section IV: Bidding Forms \(Form 4.12\)](#) is not quoted in [Annexure-4](#), it shall be considered that the remark, comment, condition, qualification or deviation is unconditionally withdrawn without any financial implication. However, Employer at its sole discretion and option may assess the financial implication of the said remark, comment, condition, qualification or deviation etc. based on best engineering principles and concepts, which shall be binding on the Bidder, and the same may be considered by Employer for financial evaluation.
4. It is certified that '[Annexure-4](#)' annexed in Technical Package is a "TRUE COPY" (with prices blanked off) of said '[Annexure-4](#)' in the Financial Package. In the TRUE COPY to be submitted in the Technical Package, the Bidder should clearly indicate in Columns D and E "Priced" or "Not Priced" while blanking off the prices.

SIGNATURE OF BIDDER

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

Annexure-5

(PRICING MECHANISM FOR ADDITIONAL SECTIONS/DEPOT/ON BOARD EQUIPMENTS)

(This Document is to be submitted by the Bidder as part of Schedules (pricing Document)). We confirm the Pricing Mechanism as below:

1. Pricing Mechanism for order up to last ROD :

1.1. For Main Line:

- i) The unit rates and the lump sum rates (for those items where unit rates are not available) of Appendix 1 - BOQ for Main Line shall remain firm for the additional section(s)
- ii) For the items quoted as lump sum in Appendix 1 - BOQ for main line, pro-rata rates based on route Km shall be applied.
- iii) In respect of Spares and Special Tools, the price will be determined on the basis of unit rate given in the offer and the quantity decided by the Employer
- iv) There will no additional type of items for additional section(s) than those covered in Appendix 1 - BOQ of this Contract;

1.2. For Station/Depot (Extension/ new):

- i) The unit rates and the lump sum rates (for those items where unit rates are not available) of Appendix 1 - BOQ for station/depot shall remain firm.
- ii) For the items quoted as lump sum in Appendix 1 - BOQ for station/depot, pro-rata rates based on material cost shall be applied.
- iii) In respect of Spares and Special Tools, the price will be determined on the basis of unit rate given in the offer and the quantity decided by the Employer.
- iv) There will no additional type of items for additional station/depot(s) than those covered in Appendix 1 - BOQ of this Contract;

1.3. For On Board equipments for the Trains (Where ever applicable):

- i) The unit rates and the lump sum rates (for those items where unit rates are not available) of Appendix 1 - BOQ for Trains shall remain firm.
- ii) For the items quoted as lump sum in Appendix 1 - BOQ for Trains, pro-rata rates on per cab basis shall be applied.
- iii) In respect of Spares and Special Tools, the price will be determined on the basis of unit rate given in the offer and the quantity decided by the Employer.
- iv) There will no additional type of items for additional On Board equipments than those covered in Appendix 1 – BOQ of this Contract;

1.4. In the case of 1.1 (additional section) & 1.2 (extension or new station/depot) above, a reduction of 20% shall be applied on Schedule A (1 to 9) i.e. Project Management & Design for the extended stations / metro corridor.

1.5. In case of 1.3 (additional on board equipment) Schedule A4 items related to Project Management and Design shall be taken as NIL.

2. Pricing Mechanism for order after the last ROD

In case, the above is exercised after the last ROD , pricing mechanism shall be same as in item 1.1, 1.2, 1.3, 1.4 & 1.5 above and an escalation as per following methodology shall be applied:

The adjustment to be applied to the amount otherwise payable to the Contractor, as valued in accordance with the appropriate Schedule and certified in Payment Certificates, shall be determined from formulae for each of the

PART C ANNEXURE II TO ADDENDUM/CORRIGENDUM (VI)

currencies in which the Contract Price is payable. No adjustment is to be applied to work valued on the basis of Cost or current prices. The formulae shall be of the following general type:

$$P_n = P_o \times (a + b \times (L_n/L_o) + c \times (M_n/M_o)) \times P_o$$

In which

P_n	=	Adjustment amount payable to the Contractor
P_o	=	Contract price (base price)
a	=	Fixed element representing profit and overhead in Contract price ($a = 15\%$)
b	=	Estimated percent of labor component in Contract price ($b = 30\%$)
c	=	Estimated percent of plant & equipment component in Contract price ($c = 55\%$)
$L_o,$ L_n	=	Labor indexes applicable to the appropriate industry in the country of origin on the base date and the date for adjustment, respectively.
$M_o,$ M_n	=	Material indexes for the major raw materials in the country of origin on the base date and the date for adjustment,

The sum of the three coefficients a , b and c shall be one (1) in every application of the formula.

Conditions applicable to Price Adjustment

- The Bidder shall indicate the source of labor and materials indexes and the base date indexes in its bid.
- For Indian Bidders: Material Index. i.e. "M" issued by IEMA for Industrial Electronics shall be applicable & Labour Index. i.e. "L" issued by Economic Advisor to Ministry of Commerce & Industries for industrial worker for the city nearest to the place of manufacturing unit shall be applicable.
- For Foreign Bidders: Indices only from recognized national institutions or Organizations shall be acceptable.
- In cases where the "currency of index" is not the relevant currency of payment, each index shall be converted into the relevant currency of payment at the selling rate, established by the central bank of the Country, of this relevant currency on the above date for which the index is required to be applicable.
- Base date will be date of last ROD
- For pure labour work $b=85$ & $c=0$

PART C Annexure III to Addendum/Corrigendum (VI)

**MODIFIED CHAPTER 11 – TELECOM SUPERVISORY
CONTROL AND DATA ACQUISITION (T-SCADA)**

PART C Annexure III to Addendum/Corrigendum (VI)

11 TELECOM SUPERVISORY CONTROL AND DATA ACQUISITION

11.1 General

11.1.1 The Telecom-SCADA is the system used for remote supervision of NMRCL Telecommunications equipments. This system has the ability to provide fault indication and diagnostic facilities. The following systems will be monitor through Telecom-SCADA system:

- Public Address System;
- Public Information Display System;
- Master Clock System;
- Telephone System;
- Radio System – TETRA;
- Closed Circuit Television System;
- Fibber Optic Transmission System – Giga Ethernet;
- Access Control and Intrusion Detection System
- UPS

11.1.2 Faults & Failure warnings and Alarms of other Systems shall be monitored by CSS. SCADA shall in addition, provide the OCC / BCC, CSS staff with the necessary information to know the capacity of these systems to cope up with the traffic being carried.

11.1.3 The SCADA shall also provide relevant data / information, which would enable the maintenance staff to assess the need for unscheduled Preventive Maintenance based on the degradation of normal operating parameters.

11.1.4 Following equipment shall be controlled and monitored through their respective Servers and NMS at OCC / BCC:

- (a) FOTS including Master Clock, UPS and Power System.
- (ii) Telephone System (Direct Line and EPBAX).
- (iii) CCTV System.
- (iv) Tetra Radio System.
- (v) Public Address System (PAS).
- (vi) Passenger Information Display System (PIDS).

11.1.5 Summary warnings and alarms for each system shall be passed on to the T-SCADA System for information and recording by the Controllers in OCC / BCC and the CSS.

PART C Annexure III to Addendum/Corrigendum (VI)

11.2 INTERFACE EQUIPMENT OF SCADA SYSTEM:

11.2.1 The following sections describe the interfaces of Telecom-SCADA with other systems in NMRCL. The purpose of the interface of T-SCADA with the other systems is to collect the faults of these systems and centralize the fault notifications.

11.2.2 Interfaces with other telecom systems

T-SCADA has the following interfaces with Telecom Systems:

- (i) GE System;
- (ii) Master Clock System;
- (iii) Telephone System;
- (iv) Radio System – TETRA;
- (v) Radio System – Broadband Radio System;
- (vi) Closed Circuit Television System;
- (vii) Passenger Information Display System;
- (viii) Public Address System;
- (ix) Access Control and Intrusion Detection System

11.2.3 External interfaces

The external interface with T-SCADA is the following:

- (i) UPS/SMPS (Interfacing has to be done with N1S01 Contractor)

11.2.4 T-SCADA operators shall monitor the faults that occur at the UPS/SMPS through this interface. To receive all faults from this interface, T-SCADA has first to establish a connection with UPS/SMPS. After the connection is established, UPS/SMPS shall send information about the occurred fault to T-SCADA through protocol viz. MODBUS. (Require info from signalling)

11.3 Software functional description

11.3.1 The Network Management Systems (NMS) from the Telecommunication systems, as faults/warnings occur, inform T-SCADA Application Software (role of which is to collect information for NMRCL maintenance staff to monitor the needs for intervention).

T-SCADA Application Software centralizes all the alarms/warnings from all systems allowing the maintenance of all assets in NMRCL.

11.3.2 The information shared by the NMS from all systems allows T-SCADA Application Software to display on the screens of the selected Telecom-SCADA users the fault/warnings, with the following details:

PART C Annexure III to Addendum/Corrigendum (VI)

- (i) System it refers to;
 - (ii) Date and time;
 - (iii) Location;
 - (iv) Priority.
- 11.3.3 The above details provided at T-SCADA Application Software operator screens ensure that the users running this application have all the relevant information so they can take appropriate actions to minimize disruptions to the metro service and inconvenience to passengers.
- 11.3.4 Moreover, the NMRCL Telecom-SCADA operators will have access to printers in order to print out any display page, reports or logs.
- 11.3.5 Telecom-SCADA receives faults/warnings from:
- fibre Optic Transmission System – Data Networks (Giga Ethernet);
 - Master Clock System;
 - Telephone System;
 - Radio System – TETRA;
 - Closed Circuit Television System;
 - Public Information Display System;
 - Public Address System;
 - UPS
- 11.3.6 All events reported to the Telecom-SCADA system are recorded in primary database in Primary Server and replicated to backup database in Standby Server. Through the usage of data contained in the database, T-SCADA Application Software is able to generate reports that NMRCL find relevant.
- 11.4 **Central Telecomm Fault Reporting System (T-SCADA)**
- 11.4.1 The indications shall ensure that the Fault and Works Coordination & maintenance Offices are alerted to enable any appropriate action to be implemented to minimize disruptions to the train service and inconvenience to passengers.
- 11.4.2 The Fault reporting system shall give the exact information about the fault/alarm from which sub system it is indicated. The fault indications displayed at the Fault and Works Coordination Office position shall indicate that a fault immediately after the fault has been detected.
- 11.4.3 The fault indications displayed at the Fault and Works Coordination Office at the engineering supervision and control desk shall indicate that a fault has been detected in a particular piece of equipment, the location of the equipment and the seriousness of the fault categorized into three levels.
- 11.4.4 The alarms shall be classified into these three levels by the individual Network Management System and be user configurable:
- 1) Emergency - this type of fault shall require instant attention by the relevant controller in order to minimize the downtime of the NMRCL or the risk of injury to personnel or passengers;

PART C Annexure III to Addendum/Corrigendum (VI)

- 2) Urgent - this type of fault shall require reasonably prompt, but not instant attention in order to minimize interruption of the normal operation of the NMRCL; and
 - 3) Non-urgent - this type of fault may be dealt with in a more convenient manner while more urgent events are dealt with first. This type of event shall not directly result in any degradation of the NMRCL performance.
- 11.4.5 An audible alarm and visual indications of different colours shall be provided to alert the Fault and Works Coordination Office that a fault has occurred.
- 11.4.6 The audible alarm shall be clearly audible against ambient noise levels. The volume of the audible tone shall be adjustable.
- 11.4.7 There shall be three (3) categories of audible alarms easily distinguishable by separate tones or sounds for events classified as emergency, urgent and non-urgent, as defined below:
- 1) Emergency - this type of fault shall require instant attention by the relevant controller in order to minimize the downtime of the NMRCL or the risk of injury to personnel or passengers;
 - 2) Urgent - this type of fault shall require reasonably prompt, but not instant attention in order to minimize interruption of the normal operation of the NMRCL; and
 - 3) Non-urgent - this type of fault may be dealt with in a more convenient manner while more urgent events are dealt with first. This type of event shall not directly result in any degradation of the NMRCL performance.
- 11.4.8 A line printed hard copy, providing all relevant details of all fault indications shall automatically be created as the faults are detected.
- 11.4.9 A mute facility shall be provided to silence the audio alarm upon the acknowledgement of the alarm by the Operator. In the event of an emergency alarm, acknowledgement of the alarm by the operator will reduce the level of volume, but not cause the audio alarm to be silenced.
- 11.4.10 It shall be possible to acknowledge alarms individually or in groups. Silencing of the alarm shall only be possible once the event has been reset (cancelled) and the event has been rectified at the equipment generating the alarm.
- 11.4.11 In the event of multiple events initiating audible alarms, only one alarm shall be broadcast at any time. The highest category of alarm shall always take priority, even in the event that a lower priority alarm is already being broadcast. Once the higher category has been acknowledged and muted, the next lowest category of alarm shall initiate the alarm broadcast.
- 11.4.12 The T-SCADA HMI shall have GUI features with auto discovery features and should have access to all sub systems of all stations of all three corridors. The GUI should follow the hierarchy of Corridors, Stations, and Systems.
- 11.4.13 Any fault in any system should result in an audio alarm & change in status of Corridor, Station which finally should lead to the defective system at that station.
- 11.4.14 Display and handling of all alarms should be as per international standards. The methodology of the same has to be submitted and got approved by Employer before implementation.

PART C Annexure III to Addendum/Corrigendum (VI)

- 11.4.15 All faults should be logged and MIS reports should be generated Corridor, System & Station wise, Formats of all MIS, Statistical & Graphical reports shall be submitted by the Contractor for approval of Engineer / Employer.
- 11.4.16 It shall be possible to monitor all the three corridors from one common T-SCADA work station by suitable authorization or different corridors from three different work stations.
- 11.4.17 A min. of 52” LED display panel shall be provided in the Central Telecom Maintenance Room so as to display equipment status and Alarms from the T-SCADA system. It shall be possible to configure simultaneous viewing / monitoring status of all the three corridors on the proposed 52” LED display terminal. If required, the Contractor shall provide additional 52” display terminals to achieve this functionality.
- 11.4.18 The 52” display panel shall be in addition to the HMI monitor provided with the T-SCADA system.
- 11.4.19 The T-SCADA and NMS of all communication sub-systems shall be so configured such that it shall be possible to be integrated with the Maintenance Management System (MMS) for integrated maintenance of the NMRCL. All communication sub-vendors/ System Integrator shall co-ordinate with the MMS implementing agency to provide the necessary interfaces & information required for successful commissioning of the MMS system.
- 11.5 **Spare & Expansion capacity**
- 11.5.1 The system shall have spare capacity to accommodate / monitor additional systems to tune of 20 %. In addition, the T-SCADA system shall support expansion capacity to the tune of 20%.
- 11.6 **Reliability & Availability**
- 11.6.1 Availability of the T-SCADA shall be better than 99.6%. Availability shall include all hardware and software of the system
- 11.6.2 MTTR for the T-SCADA shall be less than 1 (one) hour (All-inclusive exclusive). Notwithstanding the MTTR, the contractor shall ensure that the availability parameters are met.
- Contractor to take reasonable for traveling. During the DLP is required to depute on site team for maintenance 24x 7 basis.
- 11.6.3 MTBCF of T-SCADA server shall be better than 50,000 Hrs.
- 11.6.4 The service life of T-SCADA shall not be less than 15 years

Note: Provision of T-SCADA is an optional Item, Employer at its discretion may or may not operate this item

MODIFIED CHAPTER 12 - APPENDICES



TELECOMMUNICATION SYSTEMS

This chapter covers the Appendices of Particular Specifications of N1TL01 Contract.

1. Appendix A : INTERFACE RESPONSIBILITIES: The N1TL01 Contractor's responsibilities for specifications and provision of the requirements for design and works which interface with designated project contractors are given:
2. Appendix B : KEY & ACCESS DATES: The schedule of Key Dates to be met by the N1TL01 Contractor and Access Dates to be used in planning the Works are laid out.
3. Appendix C : SECTIONS Describes the name of stations ,depot and the OCC of NMRCL Corridor.
4. APPENDIX D : CABLESPECIFICATIONS: The Cable Specifications to be followed for N1TL01 Contract. These specifications will not be applicable on equipment specific cabling/wiring.
5. Appendix E : CONTRACT SPARES: The list of minimum Contract Spares to be supplied under NS01 Contract for Telecommunication Systems.
6. Appendix F : Vendor Approval.
7. Appendix G : SPECIAL TOOLS & TEST EQUIPMENTS: The list of minimum Special Tools and Test equipments to be supplied under N1TL01 Contract for Telecommunication Systems.
8. Appendix H : M M I provision schedule for Telecommunication Systems.
9. Appendix M : Earthing policy and transient protection: Describes the policy for Earthing and Transient Protection for Telecommunication Systems.
10. Appendix N : NOTUSED.
11. Appendix O: Specification of conduits and accessories for telecommunication systems.
12. Appendix P : Specification for raised access floors.
13. Appendix Q : Specification of 19" rack, fibre management system (ODF) and digital distribution frame (DDF)

APPENDIX A

In addition to the interfaces as mentioned in the system specific chapters of TS, interfaces with designated other Contractors as mentioned (not exhaustive) in this Appendix (A1 to A9).

APPENDIX A1 N1TL01/ ROLLING STOCK INTERFACES

1.INTRODUCTION

1.1. Definitions and Scope

- 1.1.1. This Appendix describes the interface requirements between Contract N1TL01 - Telecommunication and Rolling Stock Contract for Nagpur Metro
- 1.1.2. N1TL01 & RS Contractors shall ensure that all requirements of the Specification pertaining to interfaces are properly satisfied. There is possibility of having multiple contractors for telecom. N1TL01 contractor shall interface accordingly as scope of work.
- 1.1.3. The requirements specified herein are by no means exhaustive and it remains the responsibility of the N1TL01 Contractor to develop and execute an interface plan during execution of the work to ensure that:
 - (i) All interface issues between the two contracts are satisfactorily resolved
 - (ii) Supply, installation and testing of equipment and software are fully coordinated
 - (iii) All equipment supplied in the contracts are fully compatible with each other .

1.2.Interface Management

- 1.2.1. Each contractor shall establish a structured process to integrate with other systems to ensure safe, reliable and efficient operations under both normal and degraded conditions to the satisfaction of the Employer / Engineer.
- 1.2.2. Each contractor shall ensure that the equipment supplied under this Contract are properly interfaced and integrated with other systems in Nagpur Metro.
- 1.2.3. Each contractor shall appoint competent and experienced person with no fewer than 5 years of railway project experience who shall be the single point of contact for all interface design and testing works with the interfacing contractors and the Employer / Engineer.
- 1.2.4. Each contractor shall be responsible for interface identification, establishment, construction and testing works either in the capacity as the Lead Contractor or Participating Contractor.

PART C Annexure IV To Addendum/Corrigendum (VI)

- 1.2.5. Telecom Contractor shall be the lead contractor. The Lead Contractor will be responsible to initiate, plan, coordinate and produce jointly with the Participating Contractors all the required interfaces and interface design documents and interface progress reports for submission to the Engineer for acceptance. The Lead Contractor will also prepare and submit all interface meeting minutes and interface progress reports to the Engineer for information.
- 1.2.6. Rolling Stock Contractor will be the participating contractor. The Participating Contractor shall collaborate fully with the Lead Contractor in the development and finalization of the interface design, joint production of the interface documents and interface progress reports.
- 1.2.7. The costs for all interface design and testing works shall be deemed to be included in the Contract sum regardless of the actual extent of effort required or expended by the Contractor.
- 1.2.8. The Contractors shall be fully responsible for the management and control of its subcontractors in relation to all interfacing activities carried out under the Contract.

2. TRAIN OPERATING MODE

Deleted

3. INTERFACE REQUIREMENTS BETWEEN N1TL01 AND RS CONTRACTORS

3.1. General

- 3.1.1. N1TL01 Telecommunication Contractor shall provide the Rolling Stock Contractor with the final list of equipments , cable , connectors etc to be provided on the Rolling Stock. The sizes and weights of radio on-board cab equipment and antennae etc., to be mounted on the rolling stock shall also be provided as applicable. N1TL01 and RS to jointly discuss and finalise detailed installation drawings and methodologies for on board equipment and accessories. The location of the onboard cab equipment shall be mutually agreed between N1TL01 and rolling stock contractors so as to optimize seating & standing space duly considering maintainability and easy accessibility, however the onboard cab equipment shall not be placed in the under frame on account of maintainability issues.
- 3.1.2. N1TL01 Contractor shall deliver to the Rolling Stock Contractor's factories, all trainborne radio equipment, as applicable, and data to enable fitting and testing. Connector fixing and cable harnessing shall be done by Rolling stock contractor.
- 3.1.3. N1TL01 Contractor shall supply at Rolling Stock Contractor's factory pre-wired equipment racks with appropriate connectors. N1TL01 contractor shall similarly supply all the train radio (Tetra) equipments and the Train Radio Control Panel at the RS Contractor's factory. N1TL01 Telecommunication Contractor, with the details provided by the Rolling Stock contractor, shall ensure that the exterior finish and colours of the respective

PART C Annexure IV To Addendum/Corrigendum (VI)

equipment suitably harmonise with that of the cab and the vicinity.

- 3.1.4. Interfacing wiring for each module provided by the N1TL01 Telecommunications Contractor shall terminate in a quick disconnect robust plug connector suitable for traction applications, with direct cable connection as far as possible. All cable connectors shall be identified within the cubicle using robust cable markers with distinctive colours for identification of e.g. safety function cables.
- 3.1.5. For all relay contact interfaces, N1TL01 Telecommunication Contractor shall provide auto-contact jam detection and contact bounce elimination function to ensure proper operation of the system. Relays for safety functions shall comply with the appropriate internationally accepted standard specification.
- 3.1.6. The N1TL01 Telecommunication Contractor shall provide the Rolling Stock Contractor with the number of wires/ Ethernet connections required between cars of a married pair and between married pairs to transmit signals from one end of the rake to the other end through an automatic electrical coupler. Provision of redundancy and spares shall be catered for by RS contractor for Train lines/ Ethernet connections.
- 3.1.7. Deleted
- 3.1.8. Deleted
- 3.1.9. Screened cables for train borne equipment shall be properly terminated so as to ensure that no return loops are formed to cause electrical noise.
- 3.1.10. Deleted
- 3.1.11. RS contractor to ensure that all signal inputs received from telecom equipment and output signals exported to Telecommunication system shall be recorded and shall be available for retrieval for analysis / record. All signals (import/export between RS & Telecommunication) shall generally be routed through TCMS.
- 3.1.12. Deleted
- 3.1.13. N1TL01 contractor has to define as a part of interface, the signals that will be provided by telecommunication train borne equipment. Same shall be defined and submitted in detailed interface design document which shall be mutually signed by N1TL01 and Rolling Stock Contractor . The final document shall be submit to NMRCL for review and approval .
- 3.1.14. Deleted
- 3.1.15. Deleted
- 3.1.16. There shall be radio system for communication between Train and wayside(a) Radio system (Tetra) along with on board equipment supplied by N1TL01 contractor for train operation (as detailed in this TS.

Radio system (including on-board equipment) supplied by Signalling contractor for CCTV traffic and other data pertaining to control, alarm, events, special messages / advertisements (including video) etc. The details of sharing of the 2 radio systems for sending control and data information, levels and protocols thereof, will be jointly agreed by N1TL01, Signalling Contractor and RS

contractor.

3.1.17. Deleted

3.1.18. Integrated Testing and Commissioning

The Rolling Stock and N1TL01 contractor shall perform System Integration Test and the tests shall include but not limited to PA/PIDS functioning test, RCW related tests and safety related test etc.

N1TL01 to submit jointly agreed Integrated test plan (along with Detailed Interface Design Plan) to NMRCL for final approval .

3.1.19. Deleted

3.2.Deleted

3.3.Telecommunications Details to be Used by Rolling Stock Contractor

3.3.1. The following data shall be provided:

- i. The maximum power consumed by the N1TL01 Telecommunications Contractor"s equipment from the 110V DC supply under all specified operating conditions.
- ii. The number of train wires/Ethernet connections required, and the function of each.
- iii. All control logic outputs.
- iv. Electrical characteristics of the interconnection cabling and wiring.
- v. Sensitivity levels, and frequencies, which must be avoided.
- vi. The specific heat load for air conditioning purposes.
- vii. The EMC /EMI requirements including the limiting value of psophometric current, to obviate interference in the operation of signalling / telecommunication equipment
- viii. Details of the provisions required to enable the bidirectional transference of data from the train to the wayside.

3.4. Radio Equipment Cubicles

3.4.1. The Rolling Stock Contractor shall supply the Train Radio equipment cubicle enclosure(s). All supports, braces, mounting holes, cabling apertures, etc. required for mounting the cubicle and its equipment shall be properly co-ordinated between N1TL01 Telecommunication contractor and Rolling Stock Contractors to ensure secure mounting, and access. The cubicle(s) shall be resiliently mounted and suitably protected to the requisite IP level.

PART C Annexure IV To Addendum/Corrigendum (VI)

- 3.4.2. Deleted
- 3.4.3. Deleted
- 3.4.4. As a minimum, all electronic equipment to be mounted on rolling stock, including those provided by N1TL01 Telecommunication Contractor shall comply with IEC 60571: Electronic Equipment used on Rail Vehicles, for design, manufacture and testing, and shall use components purchased against an internationally recognized quality assurance and reliability certification procedure.

3.5. Antennae

- 3.5.1. N1TL01 Telecommunication Contractors shall identify roof, bogie and under frame-mounted antennae, and associated disconnection box mounting brackets and location requirements to identify cable and conduit routes required to antennae as applicable.
- 3.5.2. N1TL01 Telecommunication Contractors, for their respective scope, shall supply the necessary disconnection boxes, terminal blocks, cables and adaptation mounting brackets, flexible conduit assemblies complete with connectors and cables from antennae to the junction boxes.
- 3.5.3. The Rolling Stock Contractor will provide the antenna mounting brackets, conduits, support or clamping arrangements to ensure security and reliability.
- 3.5.4. The antenna system shall not contravene the kinematic envelope and fully meet the radio coverage requirements both for normal and reverse directions of train working.

3.6. Deleted

3.7. Deleted

3.8. Interface between TIMS and Radio Train Interface Unit.

- 3.8.1. The Rolling Stock Contractor shall provide an on-board Train Information Management System (TIMS), to log the information from the Train Radio equipments supplied by N1TL01 Telecommunication Contractor, in addition to the information shown in the Rolling Stock specification.
- 3.8.2. Data stored in the TIMS shall be password protected. Levels and protocols shall be agreed between the two Contractors. Software for downloading the data from TIMS to maintenance terminal shall be provided by Rolling Stock Contractor. N1TL01 Contractor, as applicable, shall provide Windows compatible software for maintenance terminals for viewing the data logged in TIMS. It shall be possible to extract the data remotely from OCC to a suitable terminal at OCC through the radio provided by the N1TL01 contractor.

Interface between TIMS and TRAIN RADIO complies with the following transmission technologies. RS485 (IEC/ISO 8482) Asynchronous (ISO/IEC 13239). TIMS shall monitor TRAIN RADIO status in real time.

Interface requirement such as Transmission Signal, Network Topology,

PART C Annexure IV To Addendum/Corrigendum (VI)

Polling Period , Baud Rate, Response Transmission Data Type and format, Status Data etc. shall be mutually agreed between two contractors. These shall be part of mutually agreed Detailed Interface Design Document and shall be submitted to NMRCL for final approval.

TIMS shall interface with Train Radio Interface Unit .

3.8.3. Deleted

3.8.4. The signals to be supplied from the TIMS to the equipment of N1TL01 Telecommunication contractor shall be decided jointly between the two Contractors. Final Detailed Interface Document Shall be submitted to NMRCL for approval.

3.8.5. The TIMS shall be able to communicate data to the wayside, the OCC/SCR/DCC. The data shall contain identified train alarms. N1TL01 contractor shall interface to make the data available to its destination in OCC/SCR/DCC.

3.8.6. Deleted.

3.9. Power Supply and Earthing Arrangements

3.9.1. Independent 110V d.c. power supply circuits, including positive and negative poles, for Train Radio Equipment shall be provided by RS Contractor and there shall be no physical or electrical links between these power supply circuits and other power supply circuits.

3.9.2. The Rolling Stock Contractor shall provide dedicated earthing arrangements for the train borne Telecommunication equipment. N1TL01 contractors shall specify the earth impedance required.

3.9.3. The power supply cable between the train power supply and the radio train borne equipment power equipment shall be as short as possible and directly connected to the supply without any intermediate connection.

3.10. PA & TIMS Interface

3.10.1. N1TL01 contractor shall furnish rolling stock contractor with the interface required between the train radio system and the on-train public address system to allow on-board announcements to be made from the OCC. the interface shall provide the necessary means to enable OCC to initiate triggering of pre-recorded PA messages on-train public address system. Radio System shall have capability to execute PA Message to be initiated from PAS/PIDS HMI and RCW , either one at a time at OCC.

3.10.2. The complete on-train public address system, and interface hardware, including the transmission link, and a communication panel shall be furnished by Rolling Stock Contractor. Levels and protocols shall be agreed between the two contractors. N1TL01 is responsible for provisioning of necessary bandwidth through Radio System to transfer relevant data to / from Train Borne equipment .

3.10.3. The Rolling Stock Contractors shall provide an On-Board TIMS to provide Rake ID to the Radio Equipment and also log the information from the Radio

Equipment. Rolling Stock Contractor shall provide Train ID to train radio through TIMS-Train Radio interface. The N1TL01 Contractor shall furnish the Rolling Stock Contractors with the interface required between the train radio system and the on-board TIMS for recording the initiation, termination, and success or failure of emergency calls initiated by the train driver and/or OCC on the radio. The hardware interface shall be furnished and installed by the Rolling Stock Contractors. Levels and protocols shall be agreed between the two Contractors.

3.10.4. The TIMS shall be able to communicate TIMS alarms to OCC at predefined time interval and location as decided by Nagpur Metro, using a radio interface supplied by N1TL01 Contractor. N1TL01 shall interface with the Rolling Stock Contractor.

3.10.5. Deleted

3.11. Factory Installation and Testing

3.11.1. All the special equipment associated with the radio system including the interface cables / wires between the train borne ATC and Train Radio shall be designed and supplied by N1TL01 Telecommunication Contractor, as applicable to the Rolling Stock Contractor's factory. Each contractor shall be aware of the locations of manufacturing plants, which could concurrently be manufacturing cars.

3.11.2. N1TL01 Contractor shall be responsible for providing all data and training of Rolling Stock Contractor's staff in all aspects of Train Radio installation and testing where applicable. The first set of Train Radio equipment shall be installed by the Rolling Stock Contractor, under the supervision of the Telecommunication N1TL01 Contractor's Engineer, including the wiring for the interface of the Train Radio equipment with Rolling stock.

3.11.3. RS Contractor will be responsible for installing wiring and equipment, and its testing on each car to the functioning standard agreed with N1TL01 Telecommunication contractor.

3.11.4. Testing of each car shall comply with the accepted international standards agreed between the Contractors as agreed with the Employer's Engineer. Initial Integration tests (static and dynamic) shall be done at the rolling stock factory and carried out by the test personnel of both Contractors jointly. Further main line integration tests will required to be carried out to ensure all train control functions and telecommunications between OCC and Train which will be required to be done jointly by the Rolling Stock Contractor, & N1TL01 contractor at site in Nagpur. Test certificate for the on board equipment will be issued jointly by Rolling Stock Contractor, and N1TL01 contractor. The certificates will pertain to the respective areas of the contractor's responsibility and shall be decided during the interface.

3.11.5. The Rolling Stock Contractor shall provide facilities including test track for comprehensive static, dynamic, and interface tests between the Rolling Stock and Telecommunication systems at his premises. N1TL01 Telecommunication Contractors shall be responsible for the provision of special test equipment and instrumentation.

3.11.6. Deleted

3.11.7. Should the need arise for modifications in the configurations of respective equipment or systems as a result of the integration test or otherwise, the scope of work and division of responsibility shall be jointly agreed amongst the two contractors and detailed procedure shall be developed. Rolling Stock contractor shall provide the requisite manpower to monitor and/or implement the modifications on the rolling stock for work involving scope as identified in clause 3.11.3 above.

3.11.8. Deleted

3.12. EMC/EMI Interface

3.12.1. Regarding electromagnetic interference, the N1TL01 Contractor shall provide a list of frequencies and other sensitive requirements to the Rolling Stock Contractor, to enable him to avoid such frequency bands in his design, and to provide devices to isolate the source of emission wherever required. N1TL01 contractor will have the first right of use for radio frequency for Tetra application.

3.12.2. Rolling Stock and N1TL01 Contractors shall ensure that the emission and immunity level of their respective equipment meet the requirements of EN50121-3-1 and EN50121-3-2.

3.12.3. Rolling Stock Contractor shall ensure that the return current in the track at the specified frequencies does not exceed the values specified by N1TL01 Contractor.

3.12.4. The Contractors shall also jointly develop a test plan detailing how the electromagnetic compatibility of Traction and Telecommunication systems including Radio systems will be verified. The Contractors shall work together to assure that all electronic and electrical equipment on the rolling stock works properly without interfering with Telecommunication sub- systems.

3.12.5. The cable layout of the Telecommunication systems in the cable ducts provided by the Rolling Stock Contractor shall be jointly agreed. The separation between Telecommunication cables and power cables of Traction 25 KV ac, 415V three phase AC, 230V AC single phase, 110V DC or any other similar high voltage rating shall be in accordance with the international practice and jointly agreed.

3.12.6. The cable ducts should be earthed at notionally at every 2 m and also at the ends and should be in accordance with accepted international practices.

4. SCOPE OF INTERFACE

4.1.Division of Responsibility

4.1.1. The N1TL01 and Rolling Stock Contractors shall co-ordinate interactively in order to achieve the functional and operational requirements of the system. The roles and activities of the two Contractors shall include minimum following but not limited to:

Item	N1TL01 (Telecommunicati on Portion)	Rolling Stock Contractor
1.On board radio equipment and Antennae for train radio including special cables etc	To supply the equipment to the Rolling Stock Contractor's Works	To provide in an agreed format, space in the vehicle design for fixing and installation at the manufacturer's facility, by the Rolling Stock Contractor, under the supervision of the Telecommunication Contractor.
2.Train lines/Ethernet connection	Furnish required format for this information	To provide as per telecommuication requirement.
3. Power supply and earthing for train radio equipments	Furnish required voltage values and earthing requirements to Rolling Stock Contractor for respective scope.	To provide the required voltages and earthing
4. On board announcement from OCC including triggering of pre-recorded messages	Shall provide necessary signals, bandwidth on-board to Rolling Stock Contractor.	Shall provide for necessary hardware interface, display for on-board P.A. system inside the cars.

PART C Annexure IV To Addendum/Corrigendum (VI)

Item	N1TL01 (Telecommunicati on Portion)	Rolling Stock Contractor
5.Climatic requirements for on board Train Radio cab equipments	N1TL01 Contractor to specify at an early date, the total heat load wattage, and maximum permitted temperature	<p>RS Contractor to provide Cab Air Conditioning installation to maintain a nominal temperature of 25°C. Suitable ventilation shall be provided by the Contractor for the backside area of the console.</p> <p>Rolling Stock Contractor to provide conditioning air from the saloon to all relevant signal & telecom installations to maintain a nominal temperature of 25°C. Conditioned air ventilation shall be provided by the Contractor for the console.</p>
6.EMI/EMC interface between the Rolling Stock Contractor and N1TL01 (Telecommunications) contractor.	N1TL01 Contractor shall advise EMI/EMC plan for radio and other telecom equipment to Rolling Stock Contractor at early date.	Rolling stock Contractor shall ensure the compliance of the requirements of N1TL01 Contractor for on board radio equipments.

Note: Above interface requirements are just indicative and not comprehensive. The contractors should follow the best practices of metro for the interface/integration during project execution. Interface shall be implemented once No objection is issued by NMRC

APPENDIX TD – Deleted

APPENDIX A2

**N1TL01/ CIVIL, E&M, DETAIL DESIGN CONSULTANTS AND
CONSTRUCTION CONTRACTORS INTERFACES**

1. INTRODUCTION

1.1. Definitions and Scope

- 1.1.1. This specification describes the interface requirements between Contract N1TL01 for Telecom and Detail Design Consultants (civil and E&M) and construction contractors (Civil and E&M).
- 1.1.2. In this Specification, unless otherwise stated, the term “Contracts” refers to all the relevant Contracts and the term “Contractors” refers to all the relevant Contractors.
- 1.1.3. This document shall be read in conjunction with the relevant paragraphs of the General Specification. The Contractors shall ensure all requirements of the General Specification and TS pertaining to the contracts are fully resolved and implemented.
- 1.1.4. In the event of a conflict between the Technical Specification and this specification, the requirements of the Technical Specification shall prevail.

2. CONTRACTORS’ RESPONSIBILITIES

2.1 Coordination and Interfacing

- 2.1.1. This specification outlines the Contractors’ interface requirements, which are based on the Technical Studies carried out during the early stages of the Project. However, the requirements herein specified are by no means exhaustive and it remains the Contractors’ responsibilities to develop, update and execute jointly Interface Management details during design & throughout the execution of Works, to ensure that:
 - I. All interface issues between the two contracts are satisfactorily resolved
 - II. Supply, installation and testing of equipment and software are fully coordinated
 - III. All equipment supplied in the contracts are fully compatible with each other

Annexure IV To Addendum/Corrigendum (VI)

3. SCOPE OF WORK

Item No.	Subject	Station Detail Design Contractor and Viaduct Design	Civil/ E&M/ Construction	N1TL01 contractor responsibilities
1	Layout of rooms at the station – Telecommunication Equipment Room (TER) and Station control rooms (SCR).	Prepare and furnish station drawings; Incorporate room requirements and routing of Cable ducts/ cable trays. Provision of space for Emergency stop plunger.	<p>Rooms complete with structures, false flooring (except in signal equipment room), false ceiling if necessary, finishes, fire protection, doors, lighting fixtures, Air-conditioning & ventilation and power sockets.</p> <p>Provide Cable ducts/Hangers / cable trays up to the rooms.</p> <p>General lighting will be provided by Civil contractor. For testing, power will be provided by E&M.</p>	<p>Design:</p> <p>Mark cable trays on the station drawings in close coordination with the detailed design contractor. Review design with the design contractor. Co- ordinate closely with construction contractor to ensure the requirements at site are met.</p> <p>Construction:</p> <p>Construct all cable trays within the rooms required for Telecommunication System. Provide equipment foundations/ pedestals. Install all Telecommunication equipment, cables etc. Seal the gaps after cable installation work with fire resistant material.</p>

Annexure IV To Addendum/Corrigendum (VI)

Item No.	Subject	Station Detail Design Contractor and Viaduct Design	Civil/ E&M/ Construction	N1TL01 contractor responsibilities
2.	Track side equipment & Cabling infrastructure for Telecommunication System	<p>Design cable hangers/ cable ducts, cross track</p> <p>cast in cable ducts for main Telecommunication cables throughout the guideways. Fibre optic cables throughout the guideways shall have route diversity.</p> <p>Provision of space for line side equipments Viz antenna pole, point machine, signal boxes etc.</p> <p>Design details to be worked out in interface with N1TL01 design requirements.</p> <p>Provision of drainage in viaduct</p>	<p>Cable ducts for main Telecommunication</p> <p>cables throughout the guideways.</p> <p>Cross track cast in cable ducts for main cables.</p> <p>Fibre optic cables throughout the guideways shall have route diversity</p>	<p>Design:Furnish and confirm sizes and bending radius of trays, hangers, main cable duct and cross track cable ducts for main cables in close coordination with the civil design and/ or construction contractor.</p> <p>Furnish locations of line side equipments.</p> <p>Furnish and review requirements of EMC separation for cabling.</p> <p>Review the design from detailed design Contractors.</p> <p>Construction:</p> <p>Construct all secondary containment.</p> <p>Install cable trays, risers inside the TER./ rooms/area where Telecom equipment are to be installed</p> <p>Install cables for all Telecommunication systems including provision of all cable supports.</p> <p>Install all line side equipments including equipment foundations etc.</p>
3.	Cabling infrastructure for Telecom stations at	<p>Incorporate routing of Cable ducts/ hangers/ trays for Telecommunication main cables throughout the station.</p> <p>Fibre optic cables throughout the station shall have route diversity.</p> <p>Design details to be worked out in interface with N1TL01 design requirements.</p>	<p>E&M contractor shall provide Cable ducts/ cable trays/ Hangers for routing Telecommunication cables from viaduct.</p>	<p>Design:</p> <p>Mark cable tray requirement on the GAD/3 D BIM Drawing/ CSD in close coordination with the civil design and/ or Civil and E&M construction contractors.</p> <p>Furnish and review requirements of EMC for cabling.</p> <p>Review and confirm design with the design contractor and closely co-ordinate with construction contractor to ensure that the requirements at site are met.</p> <p>Construction:</p> <p>Install cables for all Telecommunication systems.</p>

Annexure IV To Addendum/Corrigendum (VI)

Item No.	Subject	Station Detail Design Contractor and Viaduct Design	Civil/ E&M/ Construction	N1TL01 contractor responsibilities
				Install cable trays/hangers for routing Telecommunication cables inside telecom equipment room.
4.	Station Control Room	Space for work stations/ and other Telecommunication equipments.		Design: Furnish layout of Telecommunication equipment within Station Control Room for N1TL01 equipment in close coordination with the civil design and/ or construction contractor. Construction: Install Telecommunication equipment within Station Control Room.
5.	Provision of Earthing at stations in equipment rooms.		Earth bus bar Main Earth <1Ω. Clean Earth <1 Ω. Set up the earth bus inside S&T equipment rooms (TER, and SCR) from the earth bus bar provided in UPS (S&T) room	N1TL01 shall extend earth from bus bar in provided in TER & SCR to racks , cabinets and respective equipment at different locations
6.	Air Conditioning Requirements		Shall collect the detail and provide as required by the telecom contractor.	N1TL01 Shall Provide the details of equipment heat generation load, number of persons and operating temperature requirement in the Telecom Equipment Room ,station control room to design VAC system.

Annexure IV To Addendum/Corrigendum (VI)

Item No.	Subject	Station Detail Design Contractor and Viaduct Design	Civil/ E&M/ Construction	N1TL01 contractor responsibilities
7	Provision of Ethernet Channel for E&M equipment		E&M Contractor shall be responsible installation of monitoring and control equipment and to lay data cable from Telecom interface point inTERCER to E&M Control and Monitoring equipment.	N1TL01 shall provide Ethernet Channel in 1+1 redundancy at Interface point inside Telecom Rack at TER /CER of Stations, Depot ,OCC and BCC
8	Construction and Installation		Shall install the mounting and fixing arrangements for heavy equipments like CCTV monitors, display boards, analogue clocks etc., during the construction as per the S & T requirements.	E&M Contractor to coordinate and Support for Primary and Secondary fixture fixing . The fixtures will be to be designed and installed by N1TL01. Primary Fixtures & Secondary Fixtures for Telecom equipment shall be provided by N1TL01 as per aesthtics of the Station architcture. Sample to be get approved from NMRCL

Note: Above interface requirements are just indicative and not comprehensive. The contractors should follow the best practices of metro for the interface/integration during project execution. Interface shall be implemented once No objection is issued by NMRC

**APPENDIX A3
SIGNALLING/ TELECOMMUNICATION INTERFACES**

1. INTRODUCTION

1.1. Definitions and Scope

- 1.1.1. This specification describes the interface requirements between Telecommunication portions of the N1TL01 Contract and Signalling & Train Control Contractor
- 1.1.2. In this Specification, unless otherwise stated, the term “Contracts” refers to all the Relevant Contracts and the term “Contractors” refers to all the relevant Contractors.
- 1.1.3. This document shall be read in conjunction with the relevant paragraphs of the General Specification. The Contractors shall ensure all requirements of the General Specification and TS pertaining to the contracts are fully resolved and implemented.
- 1.1.4. In the event of a conflict between the Technical Specification and this specification, the requirements of the Technical Specification shall prevail.

2. CONTRACTORS’ RESPONSIBILITIES

2.1 Coordination and Interfacing

- 2.1.1. This specification outlines the Contractors’ interface requirements, which are based on the Technical Studies carried out during the early stages of the Project. However, the requirements herein specified are by no means exhaustive and it remains the Contractors’ responsibilities to develop, update and execute jointly Interface Management details during design & throughout the execution of Works, to ensure that:
 - I. All interface issues are satisfactorily resolved
 - II. Supply, installation and testing of equipment and software are fully coordinated
 - III. All equipment supplied in the contracts are fully compatible with each other

3. SCOPE OF WORK

3.1 Interface of Signalling with Public Information Display System (PIDS)

- 3.1.1 The Contractors shall interface for automatic display of train related information including train Approach ,arrivals and departures and train length on pre-designated display boards.
- 3.1.2 For each line, The Central ATS for a specific sector of the TC&S System shall send data to the PIDS to display train related information including train arrivals and departures and train length on pre-designated display boards throughout the platforms and the concourse of all stations.
- 3.1.3 Based on the information received from the TC&S System, PIDS system will initiate and co-ordinate Train arrival/ departure related PIDS message with the Public Announcement System.

Annexure IV To Addendum/Corrigendum (VI)

- 3.1.4 The PIDS will carry out time countdown based on the estimated time data sent by the TC&S System and display the estimated train arrival and /or departure particulars. The estimated time to arrive and/ or depart of the train(s) as shown on any display board will be updated automatically and will be corrected if necessary following a data update from the TC&S System.
- 3.1.5 The pre-defined message displays will be triggered by the data sent by the TC&S system including message displays of non-stopping trains passing through the stations, train not in service and user defined message displays.
- 3.1.6 The TC&S equipment at each station shall invoke the station PIDS control equipment to clear the designated row of the train arrival/ departure information on the corresponding PIDS display boards subsequent to a train departure.
- 3.1.7 The contractor shall develop detailed interface document covering the hardware interface, list of messages, type and format of message to be displayed and the protocols to be followed for exchange of data between the two systems. NITL01 and Signalling Contractor to design and implement interface in order to achieve Train Headway of 90 Sec Interface shall be design for Cental ATS and Local ATS .The detailed interface document shall be submitted for review of the Employer.

3.2 Interface of Signalling System with Passenger Announcement System (PAS)

- 3.2.1 The Contractors shall interface for automatic announcement of train related information including train arrivals/ departures and train length on the designated station platforms.
- 3.2.2 Data shall be sent by the TC&S to the PAS System in a coordinated manner to broadcast predefined train information including train Approach ,arrivals and departures on pre-designated display boards throughout the platforms of all stations.
- 3.2.3 PAS announcements will be made to alert passengers of (a) time schedules and deviations thereof (b) non-stopping trains based on the information received from the TC&S System.
- 3.2.4 The PAS will carry out the time countdown based on the estimated time data sent by the TC&S System. The estimated time to arrive and/or depart of the train(s) will be stepped down automatically every minute and will be corrected, if necessary following a data update from the TC&S System. NITL01 and Signalling Contractor to design and implement interface in order to achieve Train Headway of 90 Sec . Interface shall be design for Cental ATS and Local ATS.
- 3.2.5 The time countdown will be frozen when a train stops proceeding to the next stopping station, due to circumstance detectable by the TC&S System and relayed to the PAS.
- 3.2.6 The pre-defined announcements will be triggered by the time countdown functions of the PAS or data sent by the TC&S System including announcement of non-stopping trains passing through the station.
- 3.2.7 The contractor shall develop detailed interface document covering the hardware interface, type and format of message to be displayed and the protocols to be followed for exchange of data between the two systems. The detailed interface document shall be submitted for review of the Employer

3.3 Interface of Signalling with Master Clock System

- 3.3.1 NITL01 shall provision NTP channels for synchronisation signalling systems at OCC/ BCC and stations . NITL01 shall provision Ethernet ports at FOTS equipment in the TER

Annexure IV To Addendum/Corrigendum (VI)

/ CER . Same shall be extended and terminated to Signalling equipment by signalling contractor.

3.4 Interfave with Video Wall

The input to projection module of Video Wall will be DVI-D to have a flicker free image on the Large Screen Graphics Wall. Other Input ports - HDMI, Analog RGBHV and Display port for multiple inputs connectivity. N1TL01 shall interface with Sinalling Contractor to design and implement all Video wall interfaces .

3.5 Interface with Signalling Contractor for UPS Power Supply .

Phase 415 V AC from the UPS, to meet the requirement of Telecom, AFC and Signalling Contract shall be provided by N1S01 Contractor in UPS (S&T) Room. N1TL01 Contractor shall extend the AC Power supply from UPS Rooms to TER/CER.

N1TL01 Contractor shall work out actual load and circuit requirements for stations/Depot/OCC and shall submit the design of the AC power distribution systems for each stations /depot / OCC .

N1TL01 to interface with N1S01 contractor for UPS power requirement for Telecom Racks and equipment at stations / OCC / BCC / Depot and Metro Bhawan .

Note: Above interface requirements are just indicative and not comprehensive. The contractors should follow the best practices of metro for the interface/integration during project execution

□ End of Appendices A3 □

**APPENDIX A4
N1TL01/ TRACK CONTRACTS INTERFACES**

1.INTRODUCTION

1.1. Definitions and Scope

- 1.1.1 This specification describes the interface requirements between Contract N1TL01, Telecom and Track Contract(s).
- 1.1.2 In this Specification, unless otherwise stated, the term “Contracts” refers to all the relevant Contracts and the term “Contractors” refers to all the relevant Contractors. The individual Contractors are referred to by the corresponding Contract number.
- 1.1.3 This document shall be read in conjunction with the relevant paragraphs of the General Specification. The Contractors shall ensure all requirements of the General Specification and Technical Specification pertaining to the contracts are fully resolved and implemented.
- 1.1.4 In the event of a conflict between the Technical Specification and this specification, the requirements of the Technical Specification shall prevail.

2.CONTRACTORS’ RESPONSIBILITIES

2.1. Coordination and Interfacing

- 2.1.1. This specification outlines the Contractors’ interface requirements, which are based on the Technical Studies carried out during the early stages of the Project. However, the requirements herein specified are by no means exhaustive and it remains the Contractors’ responsibilities to develop, update and execute jointly Interface Management details during design & throughout the execution of Works, to ensure that:
 - I. All interface issues between the two contracts are satisfactorily resolved
 - II. Supply, installation and testing of equipment and software are fully coordinated
 - III. All equipment supplied in the contracts are fully compatible with each other
- 2.1.2. The interface between N1TL01and Track Contractor(s) will be for both ballasted and ballast less tracks.

3.SCOPE OF WORK

S.N.	Subject	Track Contractor(s)	N1TL01 Contractor
1	Track X-ings of Cables.	Shall provide cut-outs in the track plinth on ballast less track, at regular intervals.	Shall provide all track crossings details including pipes and support and/ or drilling of holes in the plinth.

Annexure IV To Addendum/Corrigendum (VI)

2	Installation of Track Side equipments (Radio Masts)	Shall co-ordinate with N1TL01 to ensure the compliance of schedule of dimensions. All mechanical fixtures , fitting arrangement etc for track side	Shall furnish the final size of trackside equipment's and co-ordinate with Track Contractor(s) to ensure the compliance of schedule of
---	--	---	--

Note: Above interface requirements are just indicative and not comprehensive. The contractors should follow the best practices of metro for the interface/integration during project execution

End of Appendix A4 □

APPENDIX A5

N1TL01 AND POWER DISTRIBUTION AND TRACTION SUPPLY INTERFACES

1.INTRODUCTION

1.1. Definitions

- 1.1.1. This specification covers the interface requirements between Contract N1TL01 and Power Distribution and OHE Traction supply Contract(s).
- 1.1.2. In this Specification, unless otherwise stated, the term “Contracts” refers to the Contract N1TL01, and the Traction Supply Contract(s) and the term “Contractors” refers to N1TL01, and Traction Contractors. The individual Contractor is referred to by the corresponding Contract number.
- 1.1.3. This document shall be read in conjunction with the relevant paragraphs of the General Specification. The Contractors shall ensure all requirements of the General Specification and PS pertaining to interfaces are fully resolved and implemented.
- 1.1.4. In the event of a conflict between any Particular Specification and this specification, the requirements of the Particular Specification shall prevail.

2.CONTRACTORS’ RESPONSIBILITIES

2.1. Coordination and Interfacing

- 2.1.1. This specification outlines the Contractors” interface requirements, which are based on the Technical Studies carried out during the early stages of the Project. However, the requirements herein specified are by no means exhaustive and it remains the Contractors” responsibilities to develop, update and execute jointly Interface Management details during design & throughout the execution of Works, to ensure that:
 - (i) All interface issues between the two contracts are satisfactorily resolved
 - (ii) Supply, installation and testing of equipment and software are fully coordinated
 - (iii) All equipment supplied in the contracts are fully compatible with each other

3.SCOPE OF WORK

S.N.	Subject	Traction contractor	N1TL01 Contractor
1	Radio Mast Locations		N1TL01 will provide chainages of Radio Masts to Traction contractor.

Annexure IV To Addendum/Corrigendum (VI)

2	Electrical Clearances	Traction contractor will provide Layout Plans of OHE to N1TL01	N1TL01 shall co-ordinate with Traction contractor to ensure minimum safe clearances between any telecom field installations and the live OHE part.
3	Telecom cables and exchange location	Traction contractor will perform the EMC simulation study. Traction & Telecom contractor shall jointly develop a plan detailing how EMC of OHE traction system and Telecom consideration the study conducted.	Will furnish to Traction contractor the locations of Metro telecom cables and Telephone exchanges, in sufficient details.
4	Control & Monitoring data exchange	<p>Will supply and install suitable copper/optical fibre cables including convertor for connection from RTU to fibre optic port of Telecom equipment at:-</p> <ul style="list-style-type: none"> <input type="checkbox"/> Each station telecom equipment room(from ASS, Traction Switching Station) <input type="checkbox"/> The station TER nearest to RSS, for connection from RSS including details of the cable termination at the interface points of the Traction SCADA location. 	<p>Will provide fibre optic port or Ethernet Port on FOTS network in TER Room , for the channels required for C&M data exchange and for interlinking the OCC"s at Nagpur Metro.</p> <p>N1TL01 shall plan interconnection in the CER/TER between copper cable network (FOTS) and provide the required bandwidth on FOTS system.</p> <p>Extend data connectivity through local LAN at OCC CER .</p>

Annexure IV To Addendum/Corrigendum (VI)

5	Telephone connections to the corridor internal telecom network		<p>Provide telephone(s) at</p> <ul style="list-style-type: none"> -Each ASS Room -RSS Control Rooms -OCC inside at Nagpur Metro -OHE depot inside main depot at Nagpur Metro - Phone at Both Grid substation of electricity Board through leased line(leased line will be paid by NMRCL but arranged by Telecom Contractor)..
6	Laying of C&M cables	Supply and install C&M cables in the Telecom cable trough between each traction switching station and the nearest Station Control room	Provide space in the Telecom cable supports.
7	SCADA requirements	Traction contractor will advise section wise LAN / FOTS channel SCADA requirements to Telecom Contractor	<p>Will provide Ethernet channels) from TER of station to TER of OCC.</p> <p>N1TL01 to take channel requirement and provision Ethernet channels accordingly.</p>

Annexure IV To Addendum/Corrigendum (VI)

8	Electromagnetic Compatibility	Traction contractor will give details of the EMC study carried out by him. Traction & Telecom contractor shall jointly develop a plan detailing how EMC of OHE traction system and Telecom system will be taken care of, taking into consideration the study conducted.	Contractor will coordinate jointly with Traction contractor to ensure Compatibility
9	Traction Currents	The Traction Contractor shall advise the Telecom Contractor of the normal and worst short circuit current levels, which need to be taken into account by Telecommunication Contractors in their design to take care of EMI/EMC affects.	N1TL01 to design and implement as part of interface design .
10	Earthing	The Traction & Telecom Contractors shall interface and coordinate for connection of the Telecom field equipment on the via-duct, in the Tunnel and on the platform to the Buried Earth Conductor/Earth Conductor. The connecting jumper cable for this shall be provided and installed by the Telecom contractor.	
11	Physical Interface	The Traction & Telecom contractors shall co-ordinate for ensuring the minimum safe distance between any Telecommunication field/ Platform installation and the live OHE contact point for the purpose of human safety apart from EMC/EMI consideration.	

Note: Above interface requirements are just indicative and not comprehensive. The contractors should follow the best practices of metro for the interface/integration during project execution. Interface shall be implemented once No objection is issued by NMRC

Annexure IV To Addendum/Corrigendum (VI)

4.SCADA

The SCADA for Power Distribution and Traction shall be done by Traction Contractor. Additionally, the Power Distribution and Traction Contractor shall co-ordinate with the N1TL01 Contractor for the finalizing the ergonomic design of OCC.

End of Appendix A5

APPENDIX A6

**N1TL01/ DEPOT CIVIL, E&M, DETAIL DESIGN CONSULTANT AND
CONSTRUCTION CONTRACTORS INTERFACES**

1.INTRODUCTION

1.1. Definitions and Scope

1.1.1.This specification describes the interface requirements between Contract N1TL01 for Telecom and Depot Civil/ E&M Detail Design Consultants and construction contractors.

1.1.2.In this Specification, unless otherwise stated, the term “Contracts” refers to all the relevant Contracts and the term “Contractors” refers to all the relevant Contractors.

1.1.3.This document shall be read in conjunction with the relevant paragraphs of the General Specification. The Contractors shall ensure all requirements of the General Specification and TS pertaining to the contracts are fully resolved and implemented.

1.1.4.In the event of a conflict between the Technical Specification and this specification, the requirements of the Technical Specification shall prevail.

2.CONTRACTORS’ RESPONSIBILITIES

2.1. Coordination and Interfacing

2.1.1.This specification outlines the Contractors” interface requirements, which are based on the Technical Studies carried out during the early stages of the Project. However, the requirements herein specified are by no means exhaustive and it remains the Contractors” responsibilities to develop, update and execute jointly Interface Management details during design & throughout the execution of Works, to ensure that:

- (i) All interface issues between the two contracts are satisfactorily resolved
- (ii) Supply, installation and testing of equipment and software are fully coordinated
- (iii) All equipment supplied in the contracts are fully compatible with each other

Annexure IV To Addendum/Corrigendum (VI)

3.SCOPE OF WORK

Item No.	Subject	Depot Design and Design Contractor Detail Contractor and Viaduct Design Contractor	Civil/E&M/Construction Contractors	N1TL01 responsibilities
1	Layout of rooms at the depot – TER and Depot control rooms.	Prepare and furnish depot drawings; Incorporate room requirements and routing of Cable ducts/ cable trays.	<p>Rooms complete with structures, false ceiling if necessary, finishes, fire protection, doors, lighting fixtures, Air-conditioning & ventilation and power sockets.</p> <p>Construct false floor in TER</p> <p>Provide Cable ducts /Hangers / cable trays up to the rooms.</p> <p>General lighting will be provided by Civil. For testing power</p>	<p>Design :</p> <p>Furnish layout of Telecom equipment within Depot Control Centre in close coordination with the civil design and/ or construction contractor.</p> <p>Mark cable trays on the drawings in close coordination with the detailed design contractor.</p> <p>Review design with the design contractor. Co-ordinate closely with construction contractor to ensure the requirements at site are met.</p> <p>Construction:</p> <p>Construct all cable trays (secondary</p>

Annexure IV To Addendum/Corrigendum (VI)

2.	Track side equipment & Cabling infrastructure for Telecom at Depot	<p>Design the concrete duct banks for main cables into the</p> <p>Build & Civil works for main telecom cables throughout the depot.</p> <p>Fibre optic cables shall have route diversity.</p> <p>Design details to be worked out in interface with N1TL01 design requirements.</p> <p>Provision of space for line side equipment.</p>	Cable ducts for main telecom cables throughout the depot. Cross track cast in cable ducts for main cables.	<p>Design :</p> <p>Review/ mark the requirement of concrete cable ducts for main cables including track/ road crossings for telecom/ OFC cables throughout the Depot area.</p> <p>Furnish and confirm sizes and bending radius of trays, hangers, main cable duct and cross track cable ducts for main cables in close coordination with the civil design and/ or construction contractor.</p> <p>Furnish and review requirements of EMC separation for cabling.</p> <p>Furnish locations of line side equipment.</p> <p>Review the design from detailed design</p>
3.	Provision of Earthing at equipment rooms in Depot Control Centre building.	Design of earth and earth bus bar < 1Ω in UPS (S&T) rooms	Provide Earth bus bar Clean Earth< 1 Main Earth< 1Ω in TER/CER , SCR rooms	<p>Construction:</p> <p>Extend earth from bus inside telecom equipment room, Depot control room.</p>

Annexure IV To Addendum/Corrigendum (VI)

4	Provision of earthing for Telecom equipment in outdoor depot area	Provide space as requested by N1TL01 contractor	Construction: Design earthing topology, set-up earths, lay earth cables to meet earthing requirement. (Rails will not be used for earthing). 	Construction: Provide Inputs to E&M contractor for requirement of earth for out door equipment. Design earthing topology, set-up earths, lay earth cables to Telecom Rack and
5.	Provision of Access Control Systems		Interface for all details for doors , like type of doors , frame size , locking system , space for secondary cable containment for Access Control System etc	N1TL01 to coordinate with Civil contractor for installation of Access Control systems , cables and accessories .

□

Note: Above interface requirements are just indicative and not comprehensive. The contractors should follow the best practices of metro for the interface/integration during project execution

End of Appendices A6

APPENDIX A7

N1TL01 AND Automatic Fare Collection System

1.INTRODUCTION

1.1. Definitions and Scope

- 1.1.1. This specification describes the interface requirements between Contract N1TL01 for Telecom and Automatic Fare Collection contractors.
- 1.1.2. In this Specification, unless otherwise stated, the term “Contracts” refers to all the relevant Contracts and the term “Contractors” refers to all the relevant Contractors.
- 1.1.3. This document shall be read in conjunction with the relevant paragraphs of the General Specification. The Contractors shall ensure all requirements of the General Specification and TS pertaining to the contracts are fully resolved and implemented.
- 1.1.4. In the event of a conflict between the Technical Specification and this specification, the requirements of the Technical Specification shall prevail.

2.CONTRACTORS’ RESPONSIBILITIES

2.1. Coordination and Interfacing

- 2.1.1. This specification outlines the Contractors’ interface requirements, which are based on the Technical Studies carried out during the early stages of the Project. However, the requirements herein specified are by no means exhaustive and it remains the Contractors’ responsibilities to develop, update and execute jointly Interface Management details during design & throughout the execution of Works, to ensure that:
 - (i) All interface issues between the two contracts are satisfactorily resolved
 - (ii) Supply, installation and testing of equipment and software are fully coordinated
 - (iii) All equipment supplied in the contracts are fully compatible with each other

Annexure IV To Addendum/Corrigendum (VI)

Telecom - AFC Interface

S.NO	Item	By N1TL01/2016 (Lead Contractor)	By AFC Contractor (Participating Contractor)
1	Provision of Communication channel for Implementing WAN for AFC System.	<p>Provision of Communication channel for Implementing WAN for AFC System.</p> <p>To provide the communication for AFC equipment between station & OCC and OCC & DCC.</p> <p>Provide reserved Ethernet Port in patch panel for AFC.</p>	<p>Propose and confirm the channel requirements.</p> <p>Cable connectivity and termination between AFC switch/router to Patch Panel in TER/CER.</p>
2	Master Clock Pulse (NTP) Channels for synchronisation.	<p>Provide Patch panel, cables with cable identification and termination from CLK to patch panel.</p> <p>Provide a time server and interface inputs. Integration will be at Central Server at OCC/BCC for clock synchronization by using NTP protocol</p> <p>Integration will be at Central Server at OCC/BCC for clock synchronization by using NTP protocol</p> <p>Integration will be at Central Server at OCC/BCC for clock synchronization by using NTP protocol</p>	<p>Provide connectivity and termination from AFC Layer-3 switch/router to the Patch Panel inside the Telecom Rack in TER.</p>

Annexure IV To Addendum/Corrigendum (VI)

3		<p>Configure in data switch port clock equipment to enable the connection of AFC equipment as clients to the Master Clock server.</p> <p>To provide details of connector required for the patch cord to AFC</p>	<p>Receive the clock signal from Clock System via FOTS and ensure the system clock of AFC is synchronized with the clock system.</p> <p>AFC contractor will extend and terminate the cable in patch panel.</p>
4	<p>To alarm the station or the security staff when the TVM/AVM machine(s) is being tampered or unauthorized access.</p>	<p>Provision of CCTV monitoring system (HMI) for TVM/AVM Access Door which shall point out to camera view from specific camera along with alarms when it receives triggering signal for that particular view.</p> <p>All physical wiring for CCTV interface will be done by COM sub system contractor.</p> <p>Shall provide arrangement of termination point for receiving triggering signal from AFC system.</p>	<p>Triggering signal (potential free contacts or TCP/IP) for the CCTV Central or Stations Server camera to provide coverage of tampered TVM/AVM.</p> <p>Shall provide and connect cables from TVM/AVM till termination points provided by COM. AFC-CCTV interface shall be hard wired or TCP/IP based.</p>

Annexure IV To Addendum/Corrigendum (VI)

5	High Level Alarms on CTFRS.	Telecom Contractor should integrate High Level AFC alarms to T-SCADA system. COM should coordinate for matching communication protocol (preferably NTP traps	Alarms from AFC Central Computer should have the provision of connectivity to T SCADA. AFC to provide and connect cable from AFC servers to T SCADA server in TER/CER. AFC should coordinate for matching communication protocol (preferably SNMP traps)
6	To control access in controlled areas.	Provide at stations, depot, RSS and OCC access control system compatible with the contactless smart cards supplied by the AFC contractor. Technical inputs of contactless smart cards provided for access control system. access control readers to accept the employee cards with EMV specifications.Should provide contactless readers ISO 14443 A&B ,ISO 18092 EMV level-1 certified and Level-2 as per the employee cards issued by AFC contractor. AFC contractor would provide the specification for the terminal card integration at design phase.	Provision of contactless cards (CSC) to authorized personnel as required by the Employer. Provide technical inputs of CSC to Access Control system provider as per Technical specification. Technical specifications of the contactless smart cards

Annexure IV To Addendum/Corrigendum (VI)

7	Access Control system on Manual Swing Gate	Shall provide and install access control on Manual swing gate.	Shall supply and install manual swing gate with physical provisions for installing Access control system (by COM) and provide required technical inputs for using CSC as access card.
8	Detailed Interface Document & Intergated	Responsible for furnishing and get approval of the document	Support and coordinate with NITL01 for the document and tests
9	CCTV coverage of all TVMs/AVMs and interface with TVM/AVM Alarm Handling	Number and locations of TVMs/AVMs installed at each station; Alarms and status messages generated by TVM/AVM.	TVM/AVM Installation details; relevant drawings and design information. To share protocol on which alarm shall be transferred to CCTV System locally ot centrally.

APPENDIX A8

N1TL01 AND PLATFORM SCREEN DOORS (PSD)

1.Introduction

1.1. Definitions and Scope

1.1.1.This specification describes the interface requirements between contract N1TL01 Telecom system and Platform Screen Door (PSD) Contractors.

1.1.2.In this specification, unless otherwise stated, the term “Contracts” refers to all the relevant Contracts and the term “Contractors” refers to all the relevant Contractors.

1.1.3.The specification outlines the contractor’s interface requirements, which are based on the Technical Studies carried out during the early stages of the Project. However, the requirements specified herein are by no means exhaustive and it remains the joint responsibility of N1TL01 and PSD contractors to develop, update and execute jointly an interface management details during design & throughout the execution of the work to ensure that:

- (i) All interface issues among all contractors are satisfactorily resolved.
- (ii) Supply, Installation and testing of equipment and software are fully coordinated.
- (iii) All the equipment/signals/protocols are fully compatible with each other.

2.Scope of Work

2.1 Interface of telecom system with PSD contractor

2.1.1 Deleted

2.1.2 Deleted.

2.1.3 Deleted

2.1.4 Deleted

2.1.5 Deleted

2.1.6 Deleted

2.1.7 Deleted

2.1.8 Deleted

2.1.9 Both contractors shall ensure that the equipment and its associated devices are immune to EMI/RFI and do not cause EMI/RFI problems to other system

*** End of Appendices A8 ***

Annexure IV To Addendum/Corrigendum (VI)

Appendix A9 – Interface between N1TL01 and Lift and escalator Contractor.

1. Introduction

1.1. Definitions and Scope

1.1.4.This specification describes the interface requirements between contract N1TL01 Telecom system and Lift and escalator Contractors.

1.1.5.In this specification, unless otherwise stated, the term “Contracts” refers to all the relevant Contracts and the term “Contractors” refers to all the relevant Contractors.

1.1.6.The specification outlines the contractor’s interface requirements, which are based on the Technical Studies carried out during the early stages of the Project. However, the requirements specified herein are by no means exhaustive and it remains the joint responsibility of N1TL01 and Lift & Escalator contractors to develop, update and execute jointly an interface management details during design & throughout the execution of the work to ensure that:

1.1.7.

Responsibility Matrix

S.No.	By Lift Contractor	By COM Contractor	Location	Purpose of Interface
1	<p>Shall provide enclosure , cut out, mounting plates, power supply socket outlet for CCTV Camera & PA Speaker for lift.</p> <p>Secondary containment shall be laid by Telecom Contractor whereas space provisioning for trays/ conduits to be done by Lift Contractor .</p> <p>Location of trays/ conduits/ cables/ Camera to be coordinated with Telecom Contractor</p>	<p>Shall install CCTV Camera , PA Speaker with mounting brackets as space coordinated with lift Contractor .</p> <p>Terminal Equipment and accessories to be installed roof of the Lift Car.</p> <p>To advise on cutout requirement , space for secondary cable containment .</p> <p>Detailed Power and Data Termination and associated equipment to be provided . Space for the same to be coordinated with Lift Contractor .</p>	<p>On top of Lift Car & Lift Shaft.</p>	<p>Physical Interface with Lift .</p>
2	<p>Space for Tailable Power and Data Cable . Cable to be laid and terminated</p>	<p>Installation and Termination of suitable Tailable Power & Data Cable to feed CCTV Camera and PA Speaker</p>	<p>Lift Control Panel & Lift Shaft.</p>	<p>CCTV Monitoring and Emergency announcement</p>

Annexure IV To Addendum/Corrigendum (VI)

	by Telecom Contractor			
3	<p>Shall coordinate with Telecom Contractor for furnishing Detailed Interface Document and Integrated Tests Plans .</p> <p>Shall coordinate and support Telecom for installation & commissioning of Lift equipment such as CCTV Camera , PA Speaker.</p>	Shall furnish Detailed Interface Document and Integrated Tests Plans	Lift Car	CCTV Monitoring and Emergency announcement
4	Space for Tailable LCX Cable	Shall install LCX cable , in case required to provide to provide Radio Coverage in the lifts	Lift Car	Radio Coverage inside the Lift.
5	Shall provide Lift help point equipment and shall extend cable till IDF at TER of the station / OCC / Depot with suitable cable .	Shall coordinate with Lift Contractor and incorporate Lift Help Point in Telephone Network so that in case of usage Lift Help Point call shall be generated as of Station's platform Help Points calls . These Calls shall be landed at SCR Analogue / Digital extension .	Lift's Help Point	To provide communication between Station Controller's desk and Lift passengers in case of Emergency .
6	Shall receive sample equipment from Telecom Contractor OEMs incorporation in mock up for approval prior to production.	After interface design , shall provide samples for PA Speaker , CCTV Camera for lift fitting and approval . Samples shall be delivered at lift OEM premises .	Lift Car	Test Fitting of COM equipment in lift Car .

Note: Above interface requirements are just indicative and not comprehensive. The contractors should follow the best practices of metro for the interface/integration during project execution. Interface shall be implemented once No objection is issued by NMRC

Annexure IV To Addendum/Corrigendum (VI)

APPENDIX B

KEY & ACCESS DATES:: The key dates applicable to this Technical Specification are given in the Part III, Section IX (PC) Part B.

APPENDIX C

Corridors in Nagpur (NMRCL)

NMRCL has two corridors, which consists of 36 stations as listed below.

Station Details of NMRCL with

Section ▶ Station ▼	Priority Section	Reach 1	Reach 2	Reach 3	Reach 4
		North - South Corridor		East - west Corridor	
1	South Airport Station	Congress Nagar	Zero Mile	Jhansi Rani Square	Nagpur Railway Station
2	New Airport	Rahate Colony	Kasturchand Park	Institutions of Engineers	Dosar Vaisya Chowk (Mayo Hospital)
3	Khapri	Ajni Square	Gaddi Godam Square	Shankar Nagar Square (Bank of India)	Agrasen Chowk
4		Chhatrapati Square	Kadvi Chowk	LAD Chowk	Chitar Oli Chowk (Gandhi Putala)
5		Jaiprakash Nagar	Indora Chowk	Dharampeth College	Telephone Exchange
6		Ujwal Nagar	Nari Road	Subhash Nagar	Ambedkar Chowk
7		Airport	Automotive Square	Rachana (Ring Road Junction)	Vaishono Devi Chowk
8		South Airport Station		Vasudev Nagar	Prajapati Nagar
9		New Airport		Bansi Nagar	
10		Khapri		Lokmanya Nagar	

Annexure IV To Addendum/Corrigendum (VI)

Corridor shall have interchange station – Sitabuldi , OCC/ BCC , Depot Mihan , Depot Higna and Metro Bhawan

Note: In initial phases of the Project only BCC shall be available . Initially Contractor shall be required to install, configure and test all main and redundant Telecom equipment at BCC or any other suitable location at the NMRCL network (which shall be design for BCC & OCC) .

Once OCC access is made available , respective equipment, accessories for the OCC shall be transfered and reconfigured from BCC or the other ocaion to OCC by the Contractor without having any operational interruption .

APPENDIX D

CABLE SPECIFICATIONS

1. INTRODUCTION

1.1 General

- 1.1.1. This specification covers the design and construction requirements for low smoke, zero halogen/low halogen cables for cabling system for all sub systems of telecommunication systems, except equipment specific cables, for NMRCL. System specific specifications of each type of cable are also detailed in this specification.
- 1.1.2. Cables shall comply with the latest version of the relevant requirements of British Standards, IEC standard, ASTM standards ,ITU recommendations or equivalent international standards.
- 1.1.3. All cables shall have continuous operating life of at least 25 years.
- 1.1.4. All cables used in external or open areas shall be the armored type and shall be able to with stand rain and ultra violet rays. As a minimum, all Telephone, Public Address, CCTV , Data and Power cables laid in out-door ducts /trenches /trays from the Station (e.g.to Ancillary Buildings) and within the Outdoor Depot area (e.g. one building to another) ,shall be armored type. Optical Fibre for all areas shall be armoured type.
- 1.1.5. The Employer's Representative shall have free access to the works of the manufacturer and to be present at all reasonable times and shall be given facilities by the manufacturer to inspect the manufacturing of the cables at any stage of manufacture. He shall have the right to reject in whole or part of any work or material that does not conform to the terms of this specification or and may order the same to be removed/ replaced or altered at the expense of the manufacturer.
- 1.1.6. The Contractor shall satisfy the Employer's Representative by producing certificate from a recognized testing laboratory or otherwise that the materials used and the cable itself is of the highest possible standards and complies with all relevant specifications. In case of no relevant test certificates being available tests shall be carried out by the Contractor (manufacturer) as those laid down with relevant specification but this shall not preclude any test desired by the Employer's Representative to determine the quality of the cable. For Cables as per RDSO/TEC specifications, the Contractor shall have to get the cables inspected by RDSO /TEC and all cost therein has to be borne by the Contractor.
- 1.1.7. NMRCL choose five random samples for each type of cable and send it for Independent Testing from a Government approved testing Lab. The Contractor shall coordinate the testing and bear all the costs therein.
- 1.1.8. Bedding is applicable for Armoured cables only.
- 1.1.9. Trailable cable as per RDSO/TEC latest specification (from Lift Control Panel to Lift Car) shall be supplied by COM contractor for data & Power of CCTV / PAS/ Help Point Telephone and shall be installed by Lift Vendor . N1TL01 to make corresponding interface to make provision of installation by Lift Contractor .

Annexure IV To Addendum/Corrigendum (VI)

1.2 Fire and Smoke Performance Requirements

1.2.1 General

- 1.2.1.1. It is essential that hazardous conditions arising from overheating or ignition of cables especially in the underground areas are avoided.
- 1.2.1.2. The cables for installation in underground / tunnel areas shall be manufactured from fire retardant / resistant, low smoke, zero halogen materials (FRLSZH).
- 1.2.1.3. The cables for installation in elevated/at-grade section shall be manufactured as per Indian Railways RDSO/TEC specifications, wherever available in TEC/RDSO specifications for a particular cable type. Wherein the RDSO/TEC specifications are not available then the specifications as laid down here in shall be complied with.
- 1.2.1.4. The requirements described here in below shall meet the anti-termite, pest resistant properties as far as possible and mechanical & electrical properties of the cables both during and after installation to meet the other requirements of the specifications.
- 1.2.1.5. The contractor shall comply in general with the pertinent requirements of NFPA 130 (Fixed Guide way Transit system 2007 edition issued by the US National Fire Protection Association). All other cables shall be manufactured from flame retardant, low smoke and zero halogen/ low Halogen materials complying with NFPA 130 requirements.
- 1.2.1.6. All cables used in external or open areas shall be the armored types and able to withstand ultra violet (UV) rays. External or open areas shall be the areas within the reach of sunlight or rain.
- 1.2.1.7. All insulation shall be moisture and heat resistant, with temperature ratings appropriate to the application conditions and in no case lower than 60degree C (except Data)

1.2.2 Flammability

- 1.2.2.1 The bedding and over sheath of the cable shall have a minimum oxygen index of 30 when tested in accordance with ASTM D2863/BS 2782: Part1: Method 141 /NES 715.
- 1.2.2.2 The temperature index of the bedding and over sheath of the cable shall not be less than 250° C when tested in accordance with ASTM D2863 / BS2782: Pat1 : Method 143/NES715.

1.2.3 Fire Resistance

- 1.2.3.1 Unless otherwise specified for the fire resistant requirements, all cables shall comply

Annexure IV To Addendum/Corrigendum (VI)

with reduced fire and flame propagation requirements of IEC 60332-1 & 60332-3 Cat C for single and bunched cables respectively. Loudspeaker cables in addition shall be of fire survival type to ensure circuit integrity for three hours during fire as per IEC60331

1.3 Corrosive and Acid Gas Emission

The level of hydrochloric acid of the fire retardant low smoke, zero halogen compound (filler bedding, over sheath, etc.) and the insulation of the cable shall not be greater than 0.5% when tested in accordance with BS 6425/IEC 60754: Part 1. In the case of fire retardant, low smoke, low halogen compound (filler bedding over sheath etc.) and the insulation of the cables, the level of the hydrochloric acid shall not exceed 5%. Corrosion and acid gases are defined as those, which are determined as hydrochloric acid.

1.4 Smoke Emission

- 1.4.1 The value of the smoke generated shall meet the requirements of transmittance $\geq 40\%$ as per IEC1034/BS6724).

2. OPTICAL FIBRE CABLE

In addition to the requirements specified in section 1 of appendix D of Chapter 10 of this PS, following specifications shall be complied with by Optical Fibre Cables for Underground Section used inside the tunnel, if any. For the Elevated/At-Grade Section and for any Optical Fibre Cable being laid outside the station limits and which is either buried under the earth or is laid on the via-duct, the Specifications shall be in accordance with the armoured OFC TEC / RDSO specifications no. IRS TC/55:2000 with latest amendments. The Contractor shall get these cables inspected from RDSO /TEC and all cost of inspection shall be borne by the Contractor.

2.1. ITU-T Standards

The cable shall comply with the ITU-T Recommendations G. 652(03/93) for single mode fibre.

2.2. Optical Requirements–Single Mode Fibre

Type	Single Mode
Mode Field Diameter(nominal)	
<input type="checkbox"/> depressed clad fibre	9 μ m \pm 10%
<input type="checkbox"/> matched clad fibre	9.5 μ m \pm 10%
Mode field concentricity error	<1.0 μ m

Annexure IV To Addendum/Corrigendum (VI)

Cladding Diameter	125 μ m \pm 2 μ m
Cladding non-circularity	<1%
Optical Attenuation <input type="checkbox"/> at1310nm <input type="checkbox"/> between1285to1330nm	<0.38dB/Km(cabled fibre) < 0.38 \pm 0.02 dB/Km (uncabled fibre) <0.25dB/Km(cabled fibre)
Chromatic Dispersion (1285-1330nm)	<3.5ps/nm. Km
Cut off wave length for 2 m fibre section	1320nmmaximum

Annexure IV To Addendum/Corrigendum (VI)

2.3. Construction Requirements

2.3.1. Features

The cables shall be tight buffered or loose tube type.

2.3.2. Bedding

The bedding of the cable shall be applicable for Armoured cable only and shall consist of an extruded layer of reduced flame propagation low smoke zero halogen/low halogen compounds complying with the fire performance requirements specified in clause 1 of the specification.

2.3.3. Armoured

Armour for the cable shall consist of single layer of galvanized steel tape corrugated transversely for lateral strength and to make the cable rodent and termite proof. The armour shall be electrically continuous and bonded to the outer sheath with an overlap of 10% min. Armoured cable shall be suitable for direct underground burial and inside ducts.

The thickness of stainless steel tape to alloy AISI 304 or 305 shall not be less than 0.125 mm. The height of the corrugation shall be minimum 0.6mm and the pitch shall be 2.5 mm maximum. Outer jacket of 1.8 mm minimum thickness HDPE shall be provided over the steel tape throughout the length of the cable.

2.3.4. Moisture Barrier

Cable core shall be covered with a continuous layer of a non-hygroscopic dielectric material applied longitudinally or helically with an overlap. The cable core shall be fitted with suitable material to avoid moisture.

2.3.5. Over-sheath

The Oversheath of the cable shall be an extruded layer of anti-corrosion, reduced flame propagation, low smoke zero halogen/low halogen compounds complying with the fire performance requirements specified in clause 1 of the specifications.

2.3.6. Identification

2.3.6.1. Each fibre shall be colour-coded to provide easy unit identification. The Oversheath of the cable shall be embossed with cable type and manufacturer's name.

2.3.7. RIP Cord

2.3.7.1. Suitable Rip cord (s) shall be provided which shall be used to open the sheath (s) and the armour of the cable. The Ripcord(s) shall be properly waxed to avoid wicking action and shall not work as a water carrier.

2.4. Mechanical Requirement

2.4.1. Tensile Strength (Test IEC 794-1-E1)

Annexure IV To Addendum/Corrigendum (VI)

2.4.1.1. The cable shall have sufficient strength to withstand a load of $9.8wxw \times 1.3$ Newton, where w is mass of 1Km of cable in Kg. This load shall be sustained for 10 minutes, and shall not produce elongation of cable fibre exceeding 0.25 % and shall not cause permanent damage to constituent parts of the cables. The change in attenuation loss shall not be more than 0.05dB/Km.

2.4.2. Compressive Stress(TestIEC794-1-E3)

2.4.2.1. The fibre and component parts of the cable shall not suffer permanent damage and change in attenuation shall not be more than 0.05dB/Km when subjected to a compressive load of 4000N applied between two plates of dimensions 100mmx100mm. The load shall be applied for 60 seconds.

2.4.3. Impact (TestIEC794-1-E4)

2.4.3.1. The fibre and component part of the cable shall not show any cracks or break when the cable is exposed to 10 impacts each having energy of 50 Newton from a height of 0.5 m with impacting surface radius of 300mm. The change in attenuation shall not be more than 0.05dB/Km

2.4.4. Kinks (TestIEC794-1-E10)

2.4.4.1. Bending radius with rated pulling tension as specified above shall be approximately 20 x outer diameter. When a sample of length 10 times the minimum bending radius of the cable is subjected to kinking it shall not cause break in any fibre and kink shall disappear after normalizing the cable. The change in attenuation shall not be morethan0.5dB/Km.

2.4.5. Bending Radius

2.4.5.1. The cable shall be flexible such that bending radius without pulling tension shall be approximately 20 x outer diameter without causing any damage to the cable.

2.4.5.2. Bending radius without pulling tension shall be less than 700 mm for all optical cables.

2.4.6. Length of Cable Drum

2.4.6.1. Length of cable shall be so manufactured or supplied to avoid any joint in the section between the stations. Joints if any shall be in the Telecommunication equipment rooms at stations, depots, OCC. Wastage of cable on account of small residual pieces shall be avoided.

2.5. Environmental Requirement

2.5.1. The cable shall be of outdoor type and operating in temperature range of 0° C to 55° C and humidity 100%.

2.5.2. No deterioration in cable performance shall result during storage at temperatures – 20°C to +65° C and temporarily up to +70°C.

Annexure IV To Addendum/Corrigendum (VI)

2.5.3. The cable shall be able to withstand ultraviolet radiation from sunlight without significant reduction in the service life of the cables.

2.6. Testing

2.6.1. Test method of the cable shall conform to the ITU-T Recommendations G.652 for the single mode fibre cable and relevant IEC specifications.

2.6.2. Test results and certificates shall be submitted for review by the Employer's Representative.

3. OPTICAL PATCH CORD AND PIGTAIL

3.1 Standard

3.1.1 All patch cords(or jumpers) and pigtails shall be fitted with one type of high quality optical connector such as FC/PC connectors for the single mode patch cord / pigtail at the factory. The manufacturer shall indicate the type of connector offered for the Employer's Representative to choose a suitable type. The optical type specified on the transmission equipment shall be compatible with the optical fibre termination. The coupling loss of the connector shall be less than 0.3dB repeatedly.

3.1.2 All single mode optical patch cords and pigtails shall comply with ITU-T Recommendation G.652.

3.2 Optical Requirements

Single mode optical patch cords and pigtails shall be same as for single mode fibre cable at clause 2.2 of this specification except the cut off wavelength which shall be 1240 nm maximum for patch cords and pigtails.

4. LEAKY COAXIAL CABLE

4.1 General

4.1.1 A network of Leaky Coaxial cables and low profile antenna shall be installed for radio system in the station area ,if unavoidable.

4.1.2 The train radio system shall operate in frequency band 380-450 MHz

4.1.3 The contractor shall furnish all information as asked for in this specification in respect of LCX for frequency band 380-450 MHz In addition to the requirements specified in section 1 appendix D Chapter 10 of this PS following specifications shall be complied with by LCX cables.

4.2 Construction Requirements

4.2.1 Conductors

4.2.1.1 The inner conductors shall be of high conductivity annealed copper wire / tube complying with all the requirements of IEC 60228 and BS 6360.

Annexure IV To Addendum/Corrigendum (VI)

4.2.1.2 The outer conductors shall be of punched copper tape, or of corrugated copper tube. The outer conductors which are cut having longitudinal slots so that part of the energy transmitted through the cable is coupled to the transmission system formed by the outer conductor of the cable and the external environment and vice versa.

4.2.1.3 Conductors shall be smooth, uniform in quality, free from scales, spills, splits and any other defects.

4.2.2 Dielectric

The cable dielectric shall be with foamed polyethylene.

4.2.3 Insulation

4.2.3.1 The insulation resistance between inner and outer conductors shall be not less than 20,000 M ohm-k m and that between outer conductor and separate moisture barrier shall be not less than 50Mohm-km.

4.2.4 Spark Test for Sheath

4.2.4.1 The insulation shall not break down when spark tested in accordance with BS5099.

4.2.5 Oversheath

4.2.5.1 The over sheath of the cable shall be an extruded layer of anti-corrosion, reduced flame propagation, low smoke zero halogen compound complying with the fire performance requirements specified in clause 1 of this Appendix. Single mica barrier tape under jacketing is required to prevent molten dielectric material from flowing out of the slots and igniting.

4.3 Electrical Requirements

4.3.1 The characteristic impedance of the cable shall be 50 ± 2 ohms.

4.3.2 The cable shall have minimum system loss ,i.e. minimum of the sum of attenuation and coupling loss, and maximum useful length.

4.3.3 The cable shall be capable of radiating both horizontally and vertically polarised signals and shall not produce additional attenuation or coupling loss due to the presence of oil or moisture.

4.3.4 The contractor shall furnish the following information with regard to each type of LCX cable proposed to be used along with locations where they would be used;

1. Capacitance
2. Characteristic impedance
3. Relative propagation velocity
4. Coupling loss to a half-wave dipole at 2m distance at 100, 150, 200,300,400,450MHz

Annexure IV To Addendum/Corrigendum (VI)

5. Longitudinal loss at 100m at 30 , 100 , 150 , 200 , 300 , 400, 450 MHz
6. D C resistance inner conductor (ohms/km)
7. D C resistance outer conductor (ohms/km)
8. DC Breakdown Voltage
9. Average and maximum power rating (KW)
10. VSWR over full frequency bands
11. Type of inner and outer conductor with construction and dimensions.
12. Insulation material construction and dimensions.
13. Sheath construction and dimensions with fire retardant and anti-termite properties.
14. Dielectric material / pressurization specifications

4.3.5 Following graphs of cable characteristics shall be furnished separately for both frequency bands for each type of LCX;

- (1) Linear attenuation Vs frequency
- (2) Coupling loss Vs frequency
- (3) Coupling loss Vs distance from radiating cable.

4.4 Mechanical characteristics

4.4.1 The contractor shall furnish the following information with regard to each type of LCX cable proposed to be used along with locations Where they would be used;

- (1) Weight(Kg/sq m)
- (2) Minimum bending radius
- (3) Messenger wire construction and dimensions
- (4) Tensile strength(N)
- (5) Bending moment (N.m)
- (6) Flat Plate Crush Strength (Kg/m)
- (7) Recommended pulling length (m)
- (8) Recommended temperature range during installation (degree C)

4.4.2 Environmental conditions

- (1) Operational Temperature 0°C to 55°C
- (2) Relative humidity up to 95%40°C

4.4.3 The Leaky Coaxial Cable shall be manufactured in appropriate lengths to ensure that there is no joint in the cable between stations.

4.5 Cable Construction Identification

4.5.1 The oversheath of the cable shall be embossed with the cable type and manufactures name and length marker.

4.6 Testing

Test methods of the cable shall conform to the IEC61196:Part4. Test results and certificates shall be submitted for review by the Employer's Representatives.

Annexure IV To Addendum/Corrigendum (VI)

5.0 For PA system, all cablings and wirings inclusive of loudspeaker supply circuit cabling and the Fire Detection and Prevention System to PAS interconnections shall be fire resistant, Low Smoke, Zero Halogen, in order to maintain circuit integrity in case of fire for at least 120 minutes complying to BS 6387: 1994 Categories C, W and Z/ IEC 60331-12 / UL 2196 standards to achieve the optimum fire performance level.

6.0 Not Used

7.0 Not Used

8.0 Not Used

9.0 Not Used

10.0 CAT 6e STP Cable or better

In addition to the requirements specified in Para 1 of this TS Following specifications shall be complied with by Data cables.

10.1 The Cable shall be STP Category 6e or better having following as minimum:

Nominal Conductor Area (AWG)/Diameter	0.54 +/- 0.02mm (diameter)
No. of Pairs	4 Pairs
No. of Cores	8 Cores
Conductor Stranding	Solid
Conductor Material	Bare Copper
Insulation Color/ Core Identification	Pair 1: Blue and White Blue Pair 2: Orange and White Orange Pair 3: Brown and White Brown Pair 4: Green and White Green
Insulation Diameter (mm)	1.08±0.050 mm
Nominal Cable Diameter (OD)	7.1 mm +/- 0.3mm
Nominal Jacket Thickness	0.50 +/- 0.04mm
Jacket Color	Gray or Blue or White or Green
Conductor DC Resistance @ 20 Deg C (Ohm/km)	_ 9.38 Ohms/km
Max. Capacitance Unbalanced (pf/100m)	_ 330 pF/100m
Nom. Mutual Capacitance @ 1 KHz	_ 5.6 nF/100m

Annexure IV To Addendum/Corrigendum (VI)

Max Attenuation , NEXT , DELAY , Return Loss , Min ELFEXT , Min. PSELFEXT,	As per CAT 6 e standards
Shield Material / Coverage	Overall Aluminum Foil-Polyester Tape Shield
Shield Type	Tape
Shield Drain Wire Material	Tinned Copper
Oxygen Index Test	As per ASTM D 2863
Temperature Index Test	As per ASTM D 2863
Flame Retardant Test	As per IEC 60332-1 Category C
Halogen Acid Test	As per IEC 60754-1

10.2 Factory inspection of all the cables shall have to be done by a third party agency / recognized lab and to be witnessed by employer’s representative.

10.3 Test results and certificates shall be submitted for review by the Employer’s Representative

11 LOW VOLTAGE POWER CABLE

11.1 Low Voltage Power Cable for Elevated / At Grade Section shall as per IS1554

Low Voltage Power Cable shall be of Copper conductors. The conductors shall be of stranded, high conductivity annealed copper wire complying with all the requirements of IEC 60228/BS 6360. The conductor size to be minimum 1.5sqmm.

11.2 Fire and Smoke Performance

11.2.1 The Bedding and Oversheath of the cable shall have a minimum Oxygen Index of 30 When tested in accordance with ASTM-D 2863./NES715

11.2.2 The Temperature Index of Bedding and Oversheath of the cable shall not be less than 250 Degree Celsius when tested in accordance with ASTM-D2863. / NES715

11.2.3 Under fire condition of Bedding and Oversheath, smoke generated shall meet the requirements of transmittance $\geq 40\%$ as per IEC 1034/BS6724.

11.2.4 The level of Hydrochloric Acid gas evolved from Oversheath of cable under fire condition shall be when tested in accordance with IEC 60754-1.

11.2.5 Cables shall be Fire Retardant and shall meet the requirement of IEC 60332-1 for Ignition Resistance and Flame Propagation under specified condition. Similarly Bunched Cables shall be Fire Retardant and shall meet the requirement of IEC 60332-3 for Ignition Resistance and Flame Propagation under specified condition.

11.2.6 Test results and certificates shall be submitted for review by the Employer’s Representative

Annexure IV To Addendum/Corrigendum (VI)

APPENDIX E

CONTRACT SPARES

Please refer Pricing Document – Part 1 Section IV Annexure IV B

Annexure IV To Addendum/Corrigendum (VI)

APPENDIX F

Vendor Approval

Proposed system /sub systems shall be of proven design & practice. Sub-systems and Equipment of similar design philosophy shall have been in use and have established their performance reliability on at least two mass rapid transit systems (including Railway or Airport or LRTS or Mono Rail) in revenue service over a period of two years or more in two different countries outside country of origin or at least two mass rapid transit systems (including Railway or Airport or LRTS or Mono Rail) in revenue service over a period of two years or more in India.

Bidders are required to submit performance certificates from users in support of the above performance requirements.

APPENDIX G

SPECIALTOOLS & TEST EQUIPMENTS

Please refer Pricing Document – Part 1 Section IV Annexure IV B

Annexure IV To Addendum/Corrigendum (VI)

APPENDIX-H

MMI Provision Schedule				
Location	Position	Workstation / ControlPanel		
		Type	Quantity	
Control Centre located at (OCC & BCC)	Traffic Controller 1 (TC1)	Radio Control Workstation and Radio Access Unit	1	
		CCTV Control Panel(Station Surveillance)	1	
		Direct Line Telephone Console	1	
		PIDS/PAS Workstation +PAS Control Panel	1	
	Traffic Controller 2 (TC2)	Radio Control Workstation and Radio Access Unit	1	
		CCTV Control Panel (Station Surveillance)	1	
		Direct Line Telephone Console	1	
		PIDS/PAS Workstation +PAS Control Panel	1	
	Chief Controller (CC)	Radio Control Workstation and Radio Access Unit	1	
		CCTV Control Panel (Station Surveillance)	1	
		Direct Line Telephone Console	1	
		PIDS/PAS Workstation + PAS Control Panel	1	
	Traction Power Controller1(TPC1)	Radio Access Unit	1	
		Direct Line Telephone Console	1	
	Traction Power Controller2(TPC2)	Radio Access Unit	1	
		Direct Line Telephone Console	1	
	Auxiliary Systems Controller1(ASC1)	Radio Access Unit	1	
		Direct Line Telephone Console	1	

Annexure IV To Addendum/Corrigendum (VI)

	Auxiliary Systems	Radio Access Unit	1
--	-------------------	-------------------	---

	Controller2(ASC2)	Direct Line Telephone Console	1
	Rolling Stock Controller(RSC)	Radio Access Unit	1
		Direct Line Telephone Console	1
	Assistant to Chief Controller(ACC)	Radio Access Unit	1
		Direct Line Telephone Consoleas for Chief Controller (for all stations)	1
		PIDS/PAS Workstation +PAS Control Panel	1
	Fault Management Controller	Radio Control Workstation	1
		Radio Access Unit	2
		Direct Line Telephone Console	1
	Security Controller In Control Centre	Radio Access Unit	2
		Direct Line Telephone Console	2
		CCTV Workstation (for all stations and OCC Surveillances) & Associated equipment	2
	PIDS/ PAS Back-up MMI (Position to be specified later)	PIDS/ PAS Workstation +PAS Control Panel	1
	CSS	Direct Line Telephone Console	1
		Radio Access Unit	1
PIDS/PAS Workstation + PAS Control Panel		1	

Depot in NMRCL Corridor			
Depot	Depot Controller	Radio Control Workstation and Radio Access Unit	1
		PAS Workstation(Depot area)	1

Annexure IV To Addendum/Corrigendum (VI)

		Direct Line Telephone Console	1
		CCTV Control Panel for Depot	1
	Crew Controller	Radio Access Unit	1
	PPIO	PAS Control Panel	1
		Radio Access Unit	1
	Security controller Room	CCTV Control Panel for Depot	1

SCR All stations		Radio Control Panel	1
		PIDS/PAS Workstation +PAS Control	1
		CCTV Workstation (Station Surveillance)	1
Security Control Room All stations		CCTV Workstation (Station Surveillance)	1
On each Platform (PSB) All Stations		PAS Control Panel	1 in each platform (PSB)
Crew Control Room at the		Radio Control Panel	1

Head Quarter			
Head Quarter	Security controller Room	CCTV Workstation (for Head Quarter Surveillances) & Associated equipment	2
		Direct Line Telephone Console	2
		PAS/PIDS Control Panel	1

Appendix-I, J, K and L –Not Used.

APPENDIX M

EARTHING POLICY & TRANSIENT PROTECTION-FOR TELECOMMUNICATION SYSTEMS

1. OBJECTIVES

Earthing shall be provided for all indoor & outdoor Telecommunication installations to achieve the following objectives:

- (1) To provide the safety to the operating & maintenance personnel against the electric shock on account of any potential (voltage) appearing on exposed parts with respect to earth or due to electromagnetic or due to electrostatic induction.
- (2) To ensure safe & reliable operation of the equipment by limiting or eliminating the induced voltages and transients in the Telecommunication equipments.
- (3) To protect the equipment against build up of unduly high voltages which can cause dielectric (Insulation) breakdown or damage to the equipment or their parts.
- (4) To serve as common voltage reference point wherever required.

2. POLICY

- (1) The Earthing system shall meet or exceed the requirements of relevant International standards.
- (2) Earthing and other protection devices shall be designed to accomplish the following minimum requirements but not limited to:
 - (a) Protect personnel and equipment from electrical hazards, including lightning.
 - (b) Reduce potential to system neutrals.
 - (c) Reduce or eliminate the effects of electrostatic and electromagnetic interference arising from within the NMRCL Corridor on account of Traction voltages, Traction return current, Rolling stock characteristics and other extraneous sources.
 - (d) Provide a proper earthing method for all equipment enclosures, cabinets, drawers, assemblies and sub-assemblies.
 - (e) Provide a clean zero-volt reference point where required.
- (3) The earthing system shall be so designed so as to give earth resistance within the stipulated limits (as given below) at allocations and under all climatic conditions.
- (4) Any electrical joints in the earthing system shall be protected from tapes, or such other measures.
- (5) For the purpose of measurement of earth resistance, a small interconnecting copper strip of appropriate cross-section shall be provided in the ring earth in a small manhole chamber so that the ring earth can be broken from the loop.

Annexure IV To Addendum/Corrigendum (VI)

(6) The earthing methods, design and details shall be submitted to the Employer's Engineer for review.

2.1 Stations area(Indoor Equipment's)

2.1.1 Main Earth:

Main earth (<10ohm) bus bar shall be provided in the TER, SCR & UPS(S&T) room by another Project / E&M Contractor with copper strip at each location consisting of minimum 20 holes (10 per row). This strip shall be used by N1TL01 Contractor, to extend their individual earths to their respective cables and racks / equipment's.

2.1.2 Clean Earth:

Provision and extension of clean earth (<1ohm) up to TER to be done by N1TL01 contractor. A minimum cross section of 25mm² insulated redundant copper wire shall be used for earthing. The earthing to be terminated in TER on copper strip with a copper busbar having minimum 20 holes. This Strip shall be used by N1TL01 Contractor, to extend their individual earths to their respective cables and racks / equipment's.

2.1.3 In order to ensure a captive earth connection to the cabinets and racks in TER, a minimum cross-section of 16 mm² copper wire must be used for earthing.

2.1.4 The cabinets within a row are to be conductively connected by means of screws and contact washers. Two or more rows are interconnected via the EB and if necessary, also by additional earthing cables. In case that one of the cabinets/racks is removed, it must be ensured that the other cabinets in the row remain earthed

3.0 OUTDOORINSTALLATIONS

3.1 Following outdoor installations are required to be earthed to the nearest Main Building earth by using a minimum 16 mm² copper wire ,to be provided by the respective Telecomm Contractor for his equipment:-

- (1) Metallic sheath & armouring of all cables leading out of TER.
- (2) Location Boxes.
- (3) Display Boards Racks.
- (4) Clocks
- (5) Emergency Phones in Platforms.
- (6) PIDS Display in Platforms
- (7) CCTV Outdoor installation
- (8) ACCESS Control Equipment
- (9) Any other installation as may be necessary to cover complete scope of works under the Telecommunication Contract.

3.2 The contractor shall design earthing requirements and implement them to suit requirements of various sub systems. The contractor may make use of Buried Earth Conductor along the main line, if provided by the traction contractor, as per interface specifications. Contractor shall also use suitable safety methods such as screen of wire mesh (earthed)for safety of maintenance staff wherever there is infringement of equipment installation in the signal clearance zone as per IR, RE practices.

Annexure IV To Addendum/Corrigendum (VI)

4.0 GUIDELINES FOR TRANSIENT PROTECTION & LIGHTNING PROTECTION

4.1 General

- 1) Despite the provision of earthing as specified above (1ohms), failures of communication equipment do occur on account of finite earth resistance, particularly high voltage transient.
- 2) Typically, a transient is temporary, usually short duration, surge voltage of limited energy. Electronic equipment with high input impedance is inherently more susceptible to transients. Physical distance from the transient source does not necessarily guarantee immunity from the transients.

4.2 Requirement for effective transient protection:

Suitable surge protector devices (such as MOV's & suppressor diode & G.DTube) having high surge handling capability, fast response time, low clamping voltage, etc., shall be incorporated in the communication equipment subsystems offered, to ensure that the latter withstands the conditions mentioned above without any damage or permanent degradation in performance throughout the system lifetime.

The selection criteria for such devices shall include, but not limited to, the following:

1. Reverse standoff Voltage: At least twice the maximum operating voltage.
2. Pulse Power Rating: This shall have a value to handle the peak pulse power of the transients and ensure their decaying less than 10% of the rise time for the worst pulse likely to be encountered from all possible sources including lightning and transients from overhead traction power system.
3. SPD should be capable enough to handle a surge current 10kA (8/20 μ s) impulse for Power & Telecom Network application.
4. SPD should be pluggable & resetting type, once surge is diverted ,SPD shall have health status indication.
5. Device Lifetime: This shall not be less than that of the life of system for which it affords protections.
6. The devices shall be tested against IEC61643-1,21&22 or UL1449.
7. Peak transient of up-to 700 Volts on the DC Power Supply line for several microseconds.
8. Average transient duration of 2 microseconds with a repetition frequency of 15kHz to 100 kHz.
9. For short duration transient (<5ms) the variation approaches a sine-wave.

Annexure IV To Addendum/Corrigendum (VI)

10. For longer duration transients (>5ms) the variation approaches rectangular pulses with an initial rate of rise upto 5×10^4 Volts per second.

4.2.1 Surge protection devices shall be provided on both the power and data cables (as detailed in Table -1 below) going to the various Telecom equipments installed on the platform, in the outside station building/outside in the Depot. This shall include as a minimum the following-

- Monitors- On Platform Monitors side and also inside the Telecom Room on the equipment side for Power and Data both.
- Camera- On platform/Ramp/ Parking/On trackside/Depot SPD shall be installed at camera side as well as switch-side for Power and data both.
- Clocks- As per table-1.
- Radio Antenna & GPS Cables going to the Tower/Outside/Roof- On the equipment side inside the TER on each individual cable. LCX Cable-Inside the TER.
- Loudspeakers-As per table-1
- Displays-As per table-1
- OFC Armour-Directly earthed with main earth on both ends in TER.

Table-1 below summarizes the requirement and application of Surge protection measures as overview, as a minimum:

Sub-System	Surge Protection for equipment at Platform Ramp//Parking and Depot area (Outdoor)			Surge Protection for equipment (indoor)		
	Equipment	Power Line	Data Line	Equipment	Power Cable	Data Line
FOTS				FOTS Rack	Earthing for OF	
PAS	Speaker	N/A	No	PA Amplifier	N/A	1)
	Call Station at PSB	N/A	1)	Mixer	No	No
Telephone	Telephone at PSB	N/A	Yes	MDF	N/A	yes
	Emergency Telephone at ends of platform	1)	1) at each	MDF (incoming MTNL)	N/A	Yes

Annexure IV To Addendum/Corrigendum (VI)

Clock	Slave Clock (in platform area). Depot	yes	yes	Sub- master Clock/ change over switch	No	Yes
PIDS	PIDS at platform area	Yes	Yes	PIDS cabinet	Yes	Yes
CCTV	CCTVcamera	Yes	Yes	CCTV Monitor	Yes	Yes
	CCTVMonitor	Yes	Yes	Field switch	Yes	Yes
SMPS				SMPS	Yes	N/A

4.1.3 Lightning Protection

4.1.3.1 While the station buildings shall be provided with the lightning protection arrangements, the protection against lightning surges travelling through conductors into equipment's side shall be done by the Telecommunication contract or using appropriate devices.

The lightning protection modules for the indoor equipment of the electronic systems are to be positioned on the cable terminal rack. The modules will be fixed between indoor and outgoing cables.

4.1.3.2 Earthing and other protective measures in preceding paras are given only as indicative guidelines. Telecomm Contractor shall design, manufacture, install and be responsible for safe and correct working of all equipment /subsystems under the scope of Telecommunication. To achieve this objective, Telecom Contractor shall submit his proposals Requiring any changes/modifications in above. Telecom Contractor shall also submit his proposal for protection devices at power lines, data communication lines and equipment parts and elsewhere for review.

Appendix N: Not Used.

APPENDIX O

CONDUITS AND ACCESSORIES

1. General

- (a) All conduits and fittings shall be heavy gauge, hot-dipped galvanized Welded steel complying with BS 4568:Part1 Class4,BS EN 50086 or equivalent Indian Standards (IS 9537, Part II etc.) and shall be of screwed classification.
- (b) All conduit fittings and components shall be in accordance with BS 4568:Part2.
- (c) Conduit terminations at apparatus subject to vibration or movement shall be made in heavy gauge sheathed flexible metallic conduit. Adaptors shall have male threads for connection to the rigid conduit system via an adaptable box.
- (d) Flexible conduit and fittings shall comply with BS 731: Part I or equivalent Indian Standards.
 - (e) The minimum size of conduit shall be 20 mm diameter.
- (f) To satisfy requirements for earth fault loop impedance, the layout of conduit, trucking and ducting and routing of cables shall ensure that The maximum circuit lengths allowable are not exceeded.
- (g) Separate conduits system shall be provided for low voltage circuit, extra low voltage circuits, fire alarm circuits and emergency lighting circuit as stipulated in BS 7671.
- (h) Inspection-type conduit bends, elbows and tees shall not be permitted.
- (i) All boxes and conduit accessories shall be fully weatherproof when used in outdoor locations and tunnels. Weatherproof boxes and Conduit accessories shall also be used in locations other than out doors where specified.
- (j) Covers for external application shall have machined faces, and shall Be provided with neoprene type gaskets .No box shall be fixed in such a position as to be inaccessible on the completion of the building structure or other services.
- (k) All draw boxes and junction boxes shall comply with the appropriate BS or equivalent IS and is of ample size to permit the cables being drawn in and out. They shall be made of galvanized malleable iron with jointing surfaces machined to ensure a dust tight joint. All circular boxes shall be provided with long spouts, internally threaded, Incorporating a shoulder for the proper butting of the conduit and a tapped 5 mm hole in the base to accept a solid brass earth terminal.
- (l) The ends of all conduits shall be reamed to remove all burrs or sharp edges after the screw threads have been cut. All dirt, paint or oil on the screwed threads of the conduit, sockets and accessories shall be removed before installation.
- (m) The ends of the conduits shall butt solidly in all couplings. Where conduits connect to distribution boards, trucking, switch and fuse distribution boards, trunking, switch and fuse units, single and multiple switch boxes ,etc., they shall be connected to the apparatus by means of a conduit coupling and hexagon male smooth bore hot dip galvanized bush. Compression washers and sockets.
- (n) All conduits shall be kept 80 mm clear of water, gas and other services. All necessary equipotential bonding shall be installed including that for piped services, in accordance with BS7671.
- (o) No water shall be allowed to enter the conduit at any time and all conduits shall be arranged with adequate ventilation and drainage.

Annexure IV To Addendum/Corrigendum (VI)

- (p) Where an exposed galvanized surface has been cut or otherwise damaged it shall be repaired by application of a zinc rich epoxy primer with a generous overlap on the existing sound metal coating. Exposed threads and connections shall be similarly treated. The epoxy primer shall be used strictly in accordance with the manufacturer's instructions.
- (q) All bends shall be made on Site to suit Site conditions. Bending of conduit shall be done without the use of heat, using a bending tool that complies with the British Standard appropriate to the conduit material. An adequate number of suitably sized hot-dip galvanized cast iron draw-in boxes shall be provided in conduit runs to enable cables to be drawn in easily and without damage. Draw – in boxes shall be provided in conduit at the following maximum intervals:
 - (1) Straight run 8m,
 - (2) Run with one or two bends 6m,
 - (3) Run with three bends 4m,
 - (4) Run with four bends 2.5m.
- (r) All conduits shall be swabbed through before wiring is commenced and cables shall not be drawn into any section of the system until all conduits and draw boxes for that particular section are fixed in position.
- (s) All conduit systems shall be electrically and mechanically continuous And substantially water- tight after installation.
- (t) Wiring shall be carried out on the loop –in system and no joints other Than the looping-in points will be allowed.
- (u) No cables installed in conduits shall be laced.
- (v) No conduit shall be under mechanical stress.
- (w) Temporary plugs shall be fitted to open ends of conduit and ducting to prevent ingress of water and solid material.

2. Surface Conduit

- (a) All conduit boxes and accessories for surface conduits shall be of a type manufactured specifically for that purpose.
- (b) All surface mounted conduits shall be run neatly on the surface of the building and truly vertical and horizontal, substantially supported at 1200 mm centers on vertical runs and 900 mm centres on horizontal runs. The false ceilings shall not carry the weight of the conduit or any equipment rigidly connected to it. Conduit shall be supported in accordance with BS 7671, or other international standards independently of the suspended ceilings.

3. Flexible Steel Conduits

The flexible conduits shall be of galvanized steel. Where flexible steel conduit is employed , the length shall not exceed 2.5meter.

APPENDIX P: Not Used

Appendix Q

1. SPECIFICATION FOR 19" RACK (800 W X 2000 H X 1000 D):

The floor mounted Rack shall have the following specifications as minimum:

- a) Front and Rear Perforated doors, around 75% Perforation, P U Gasket.
- b) Side panel, 1.5 mm with PU Gasket
- c) Full Height 19" angle
- d) Top and bottom cover
- e) Socket strips (5/15amps, 10points 2 strips with locking Arrangement to avoid loose Contact
- f) Fan trays with 4 Fans with finger guard Earthing kit
- g) Vertical cable managers on both sides
- h) Horizontal cable managers (5Nos.)
- i) Make- Rittal, APW President or equivalent subject to meeting the above specifications.

2. Fibre Management System (FMS)

2.1 Specifications for Fibres FMS / Optical Distribution Frame(ODF)

Fibre Management / ODF should have following as minimum:

S.N	Items	Minimum Quantity
1	Front Access	Yes
2	Type of Adaptors	LC with insertion Loss of Adaptors < 0.1 Db
3	Cable entry	Backside
4	Pigtails	Insertion Loss < 0.1Db
5	Anti Rodent Entry	The rear cable entry shall have the cover plate to restrict the rodent entry
6	Loose tube Protection	Spiral tube is to be provided for the Protection and easy routing of the loose tube in the loose tube storage space.
7	Bend controls in splicing trays	The splicing tray is to be so designed that it guides and protects the pigtail and ensure Controlled cable bending
8	Modular Construction	Flexible upgrade and expansion ready, customized application.
9	Grommets at cable entry	To reduce dust entry or physical damage to the cable

PART D : Drawings

1. Station Drawings (architecture) for Priority Section and Reach 1
2. Tentative Drawing of MIHAN Depot (architecture)
3. NMRCL General Alignment Drawing updated on 23.07.2016

Are available on Nagpur Metro e-tender portal <https://nagpurmetrorail.etenders.in>