



LUCKNOW METRO RAIL CORPORATION LIMITED

Administrative Building, Vipin Khand Gomti Nagar Lucknow – 226010

E-mail: drslucknowmetro@gmail.com

Our Ref: LMRC/System/Tender/Tele/

Date: 27.08.2015

To,

All Bidders

Sub: Corrigendum-1 to Tender Package LKS 02

Ref: Design, Manufacture, Supply, Installation, Testing & Commissioning of Telecommunication Systems for Phase-1A.

Dear Sirs,

Please find enclosed Corrigendum-1 to Tender Package LKS 02 as correction on account of typographical errors.

Encl.: a/a

(Mahendra Kumar)

Director (Rolling Stock & System)

INDEX

| S. No. | Description | Volume/Section | Page No. |
|---------------|--|-----------------------|-----------------|
| 1 | Notice Inviting Tender (NIT)- Date & time of Submission & Opening of Tender has been revised | 1 /NIT | 1R1 |
| 2 | Clause 1.1.4.3 Correction in Annexure no. "Annexure-3B replaced by Annexure-2A" as typographical error | 1 /NIT | 7R1 |
| 3 | Clause 1.1.4.3 "LKRS02 replaced by LKS02" as typographical error | 4/Chapter1 | 13R1 |
| 4 | Clause 8.3.6 "CS15 replaced by LKS02" as typographical error | 4/Chapter1 | 32R1 |
| 5 | Clause10.3.1.3 "CS15 replaced by LKS02" as typographical error | 4/Chapter1 | 44R1 |
| 6 | Clause10.3.1.3 item no. 7 "No. of required keys revised" as typographical error | 4/Chapter3 | 22R1 |
| 7 | PHASE III replaced by PHASE-IA as typographical error | 4/Chapter10 | 4R1 |
| 8 | "CS12 & CS14 replaced by LKS02 as typographical error | 4/Chapter10 | 12R1 |
| 9 | CS12 replaced by LKS02 as typographical error | 4/Chapter10 | 15R1 |
| 10 | CS14 replaced by LKS02 as typographical error | 4/Chapter10 | 16R1 |

NOTICE INVITING TENDER (NIT)**1.1 GENERAL****1.1.1 Name of Work:**

Lucknow Metro Rail Corporation (LMRC) Ltd. invites Open Tenders on international competitive basis from eligible applicants from all countries and all areas, who fulfil *pre qualification criteria* as stipulated in clause 1.1.4 of NIT, for the scope

“Design, manufacture, supply, installation, testing and commissioning of Fiber Optic Transmission System, Telephone System, Train Radio TETRA System, Public Address System, Passenger Information Display System, Master Clock System, CCTV System and Power Supply System (for Signalling, Telecommunication & AFC equipments), supply of spares and the training of operation and maintenance personnel for these systems for Phase-1A of Lucknow Metro Rail Project”

The brief scope of the work and site information is provided in ITT clause A1 & specification are described in Employer Requirements (Volume –3 & Vol. 4)

1.1.2 Key details :-

Approximate Cost of work for LKS 02= INR 133 Cr.

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|---|---|
| Tender Security amount | INR 1.33 Cr. |
| Expected Completion period of the Work | 30 months |
| Tender documents on sale | From 23.06.2015 to 22.07.2015 (between 09:30 Hrs to 17:30 Hrs) on working days |
| Cost of Tender documents | INR 21000/- (inclusive of 5% UPVAT) (Demand Draft in favour of “Lucknow Metro Rail Corporation Ltd”) payable at Lucknow. |
| Last date of Seeking Clarification | 23.07.2015 |
| Pre-bid Meeting | 24.07.2015 @ 12:00 Hrs |
| Last date of issuing pre-bid replies and addendum | 04.08.2015 |
| Date & time of Submission of Tender | 25.08.2015 08.09.2015 upto 15:00 Hrs. |
| Date & time of opening of Tender | 25.08.2015 08.09.2015 @ 15:30 Hrs. |

prescribed format shall be certified by the Chartered Accountant with his stamp and signature in original.

- Value of existing commitments for on-going construction works during period of **36 months** w.e.f. **tender submission date** has to be submitted by the tenderer in **Annexure-3B2A**. These data shall be certified by the Chartered Accountant with his stamp and signature.
- In the case of a group, the above formula will be applied to each member to the extent of his proposed participation in the execution of the work. If the proposed % is not provided, equal participation will be assumed.

1.1.4.4 The tender submission of Tenderers, who do not qualify the minimum eligibility criteria & bid capacity criteria stipulated in the clauses 1.1.4.1 to 1.1.4.3 above, shall not be considered for further evaluation and therefore rejected. The mere fact that the tenderer is qualified as mentioned in sub clause 1.1.4.1 to 1.1.4.3 shall not imply that his bid shall automatically be accepted. The same should contain all technical data as required for consideration of tender prescribed in the ITT.

1.1.4.5 Deleted

1.1.5 **The Tender documents consist of :**

Volume 1

Notice Inviting Tender
(With Qualification Requirements)
Instructions to Tenderers (including Annexures)
Form of Tender (including Appendices)

Volume 2

General Conditions of Contracts
Special Conditions of Contract (including Schedules)
Condition of Contract on Safety, Health & Environment (SHE)

Volume 3

Employer's Requirements – General specifications

Volume 4

Employer's Requirements – Particular Specifications

Volume 5

Tender Drawings

1.1.6 The Tenderers may obtain further information/ clarification, if any, in respect of these tender documents from the office of Director (Rolling Stock & Systems), Lucknow Metro Rail Corporation, Administrative Building, Vipin Khand, Gomati Nagar, Lucknow-266010.

1.1.7 All Tenderers are hereby cautioned that tenders containing any material deviation or reservations as described in Clause **E 4** of "Instructions to Tenderers" and/or minor deviation without quoting the cost of withdrawal shall be considered as non-responsive and is liable to

| | |
|---|---|
| Specification for Safety of Information technology equipment including electrical business equipment. | BS EN 60950-1:2006 |
| Electromagnetic Compatibility (EMC) : Generic standards immunity for Industry environments. | BS EN 61326 (Annex A) |
| Specification for safety requirements for equipment to be connected to telecommunication networks. | BS EN 41003:1999 |
| Safety requirements for electrical equipment for measurement, control & laboratory use. Part 1: General requirements. | BS 61010-1:2003/A2:1995 |
| Secondary protectors for Communication Circuits. | Underwriters Laboratory safety std 497A |

1.5 Overview of Telecommunications System

- (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.
- (2) The FOTS and Wide Area Network being provided under LKS 02 shall provide all necessary communication channels for carrying voice, data, and video signals for Metro railway management and operation from Station/Depot TER to OCCs CER.
- (3) A Master Clock System shall be provided under LKRS 02 to distribute time signal to all the clocks at stations and Depot and OCCs. Master Clock System shall also provide reference timing signals for all telecom and other systems like AFC, Power SCADA etc for time synchronization.
- (4) This backbone transmission network, which shall provide the necessary communication channels in the MRTS, shall be of adequate high quality, and shall have high reliability, availability and expandability. On this back bone network in the MRTS, a private telephone exchange network shall be constructed to provide basic telephone communication within the MRTS it shall be used for MRTS management, personnel management, facility maintenance, train operation and passenger guidance.

The telecommunication system shall also consist of a direct line telephone communication network exclusively for the train operation and maintenance functions

- (1) Factory Acceptance Tests (FAT)
- (2) Installation Tests (IT)
- (3) Partial Acceptance Tests (PAT)
- (4) System Acceptance Tests (SAT)
- (5) Integrated Testing and Commissioning (ITC)

8.3 Factory Acceptance Tests

8.3.1 The Contractor shall carry out factory acceptance tests at the place of manufacturing in the presence of the Employer's Engineer. The test shall include, but not be limited to, visual, environmental, electrical and functional tests on each individual equipment and associated Subsystems as well as simulation before delivery of the equipment to the Site.

8.3.2 Factory acceptance test shall be carried out for equipment and cables.

8.3.3 The Contractor shall prepare and submit a Factory Test Plan at least Three months before the tests. In addition, the Factory Test Plan shall also include the following:

- (1) A list of equipment and cables for individual Subsystem to have factory acceptance test.
- (2) The program of all the activities related to factory acceptance tests.
- (3) The locations where factory acceptance tests to be carried out.
- (4) The estimated duration of tests activities at each locations.
- (5) Submission schedule of all the factory acceptance test procedures for equipment and cable.

8.3.4 The Contractor shall prepare the Factory Acceptance Test Procedures for equipment and cables and submit to the Employer's Representative for review.

8.3.5 The Factory Acceptance Test Procedures shall describe in detail all tests to demonstrate the functional, electrical and physical performance of the equipment and cable under designed environmental conditions.

8.3.6 Where any part of testing is carried out by an independent laboratory, a copy of Test Certificate issued by the relevant authority of that laboratory shall be submitted along with the Acceptance Test Procedure. The Employer's Representative reserves the right to demand Third Party Inspection to be carried out at the cost of [GS15LKS02](#), if [GS15-LKS02](#) is not able to provide or substantiate test results.

8.4 On-site Testing and Commissioning

8.4.1 General

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

- 10.3.1.3 The tentative space allocation for ~~CS15-LKS02~~ Contractor in CER/TER will be as follows:

| Equipment Room | Approximate Total floor space (m ²) |
|--------------------------|---|
| CER at OCC/BCC | 60 |
| TER in stations & Depots | 30 |

Table 10-1 Tentative space allocation at CER and TER

LKS 02 contractor shall interface with other relevant project contractors for the final layout of Telecommunication Sub System for all stations, depot and OCCs.

- 10.3.1.4 For exact room dimensions, the Contractor shall however co-ordinate and refer to the final station building plans.
- 10.3.1.5 The Contractor shall liaise with the Employer's Representative and relevant Project Contractors for access to the equipment rooms for installation.
- 10.3.1.6 All floor mounted equipment cabinets at the equipment room shall be securely bolted to ground with base frame, properly aligned and levelled.
- 10.3.1.7 All wall-mounted equipment shall be installed at appropriate height to avoid any hazards to the person passing by. The Contractor shall ensure the wall is of sufficient strength to hold the wall-mounted equipment in a secure and safe manner.
- 10.3.1.8 The floor mounted equipment cabinets shall be arranged in the way to allow sufficient space at the front and rear side of the cabinets for maintenance access. Sufficient space shall also be allowed for front maintenance access of the wall mounted equipment.
- 10.3.1.9 The equipment layout within the equipment room shall be co-ordinated with other relevant contractors, who share the same equipment rooms for their equipment. Further the equipment layout within the equipment room shall be designed to allow sufficient clearance for escape out of the equipment rooms in case of emergency.
- 10.3.1.10 The Contractor shall submit the following to the Employer's Representative for review at least three months before the commencement of the installation inside the equipment room:
- (1) Drawings showing the equipment layouts and positions of the racks, cabinets, enclosures and Base Frame duly agreed with other project contractors.
 - (2) Racks, cabinets layout drawings showing the arrangement of individual module
 - (3) Specifications, sample of all the mounting brackets and accessories
 - (4) Equipment mounting and installation methods
 - (5) Schematic diagrams and wiring diagrams of the System

- (7) A minimum of ~~20-10~~ memory keys ~~with 10 keys~~ for speed dialing ~~or 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;
- (8) Desktop/Wall mounted type as per site requirement.

5.1.1.13.2 **Not Used.**

5.1.1.13.3 **Digital Feature Telephone**

The digital feature telephone shall be equipped with, but not be limited to, the following facilities:

- (1) Handset;
- (2) 12 push-button keypad;
- (3) Adjustable volume control for speaker and ringer;
A minimum of 10 programmable function keys for assignment of features or additional extension circuits;
- (4) A minimum of 20 memories for speed dialing;
- (5) Hands-free operation through built-in speaker and microphone;
- (6) Powered by the EPABX switch;
- (7) Visual display of details for incoming and outgoing calls;
- (8) Display of call duration;
- (9) Dial by name, dictionary
- (10) Intercom facility;
- (11) System clock display;
- (12) On-hook dialing;
- (13) Programmable for multi-lines operations with more than one extension number assigned; and
- (14) Support "boss-secretary" combination with intercommunication between the two parties via the depression of a single button
- (15) Lamp for message waiting; and

The digital feature telephone shall support ISDN BRI (2B+D) signaling (supply to exclude the supply of the adapter module)

The digital feature telephone shall be programmable for multi-lines with more than one extension number assigned.

2.0 **Scope of Work:** Scope of work is mentioned in the table given below:

| <u>PHASE III—IA : Scope of work</u> | | | | |
|--|---|---------------|------------------------------------|---|
| 1 | UNDERGROUND SECTION | | | |
| A | TUNNEL REQUIREMENTS | Design | Construction /Execution Contractor | Inputs to be given by and co-ordination with construction/ execution contractor |
| 1 | (A) Provision of space on outer edge of tunnel wall (Bored Tunnel) for installation of stand -Offs for laying of LCX cables for GSM/CDMA/TETRA. B) Provision of space in cut & cover Tunnel for installation of stand -Offs for laying of LCX cables for GSM/CDMA/TETRA. | DDC/Architect | N.A. | Telecom System contractor |
| 2 | Cross over pipes are required for laying of TETRA/GSM/CDMA cables from under croft to the outer edge of tunnel wall in station Box area for each tunnel as per Telecom requirements. Cross over pipes are required wherever crossing of Telecom cables is required. | DDC/Architect | Civil | Telecom System contractor GSM/CDMA Operator |
| 3 | Brackets/hangers are to be provided on tunnel inner edge for laying of optical fibre cable and emergency telephone cables as per telecom requirements. | DDC/Architect | E & M | Telecom System contractor |
| 4 | Cable tray connectivity is to be provided from Telecom brackets in tunnel to telecom cable trays in nearest S&T shaft. | DDC/Architect | E & M | Telecom System contractor |
| 5 | Provision of space in tunnels is to be done for GSM/CDMA Repeaters as per GSM/CDMA operators requirements (preferably be provided in cross passage).Cross over pipes are required at repeater location as per GSM/CDMA operator requirement. | DDC/Architect | N.A. | Concerned GSM/CDMA Operator |
| 6 | Provision of Power supply for GSM/CDMA Repeaters in tunnel. | DDC/Architect | GSM/CDMA Operator | Concerned GSM/CDMA Operator |
| 7 | Provision of space for emergency telephone at cross passages to be done as per telecom requirements. | DDC/Architect | N.A. | Telecom System contractor |
| 8 | Provision of main earth (<2ohm) strips at cross passages for emergency telephones. | DDC/Architect | Traction | Telecom System contractor |
| 9 | Provision of Temporary power and illumination in Tunnel to be provided for installation of emergency telephone and stand offs for LCX cable of GSM/CDMA/TETRA system. Temporary lighting in Tunnel should not be provided in space reserved for GSM/CDMA/TETRA cables in Tunnel | DDC/Architect | Civil, as per appendix A10 | Telecom System contractor |

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| 17 | Data and power tray should have separation of at least 150mm between them at any place and if crossing is required there should be provision of a bridge to cross the cable tray. | DDC/Architect | E&M | Telecom System contractor |
| 18 | Cable tray junctions and T points should not have sharp bends and edges to avoid cable damage. The bending radius of minimum 1.5m shall be provided. | DDC/Architect | E&M | Telecom System contractor |
| 19 | Provision of Space and construction of ESP/ PSB as per telecom requirements is to be done at middle of the each Platform. | DDC/Architect | Civil, as per CSD | Telecom System contractor |
| 20 | Provision of Space for CCTV field switch installation at both platforms to be done | DDC/Architect | Civil | Telecom System contractor |
| 21 | Tray connectivity for Platform Supervisory Booth (PSB) from the nearest S&T Tray. | DDC/Architect | E&M | Telecom System contractor |
| 22 | In station area with false ceilings, cut outs are to provided for installation of speakers clock, PIDS and CCTV cameras and CCTV Monitors. | DDC/Architect | Civil, as per CSD | Telecom System contractor |
| 23 | Provision of space for installation and mounting of PIDS/SPEAKERS/ CCTV /CLOCK/ on portal is to be done. Signage should not block visibility of PIDS, clock, CCTV cameras and CCTV monitors at concourse and platform level | DDC/Architect | N.A. | Telecom System contractor |
| 24 | Space for Clean earth (Two locations of 1mx1m Space with 3m separation between these locations) to be provided at ground level near to TER. Location of clean earth pits should be at least 20mts away from main earth pits. | DDC/Architect | DDC | Telecom System contractor |
| 25 | Extension of clean earth (<1 ohm) to be done from Clean Earth Mat location to TER. Copper Bus bar with min.20 holes (10 per row) to be provided in TER. | DDC/Architect | CS12LKS02 | Telecom System contractor |
| 26 | Provision of Main earth Pit. Extension of Main earth (<2 ohm) from Main Earth Pit and termination at copper bus bar with min.20 holes (10 per row) to be done in TER, UPS (S&T) Room and SCR. | DDC/Architect | E&M | Telecom System contractor |
| 27 | For Station with radio tower, 10x10 sq meter space at road level in vicinity of TER is required for Radio tower installation. Minimum distance from OHE should be 15m. Also 5x50sq meter open space required for assembly of tower and its erection. Hume pipes to be provided from station building up to Tower location with Pull pits as per requirement. At every bend of Hume pipe, pull pit is required | DDC/Architect | Civil, as per CSD DDC | Telecom System contractor |
| 28 | Construction of Tower Foundation, Tower structure, erection of radio Tower, supply and erection of fence, provisioning of radio earth | CS14LKS02 | CS14LKS02 | N.A. |

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|----|--|---------------------------|---------------------------|--|
| 1 | Base frame, False Floor and under false floor cable tray with required risers for wall mounted units for All Telecom Systems as per Appendix N of this chapter. Raised false floor should have minimum clearance of 300 mm from Finished Floor Level. False flooring should be capable of handling loading capacity of 600 kg/m. | Telecom System contractor | Civil, as per CSD | DDC/Architect and other Telecom System contractors |
| 2 | In Depot, DATA/POWER trenches with covers and pull pit arrangement to be provided from TER to different utility buildings like DCO, Canteen, sub station, Time office, PWAY, Inspection bay, Auto wash plant, Stabling Shed, Pump room, Workshop building, Pit wheel lathe and RSS/TSS building ,security rooms, Staff rooms, watch tower, depot entry /exit etc. Hume pipes shall be used for track crossings and providing connectivity from trench up to utility buildings, Staff Quarter (if any) etc. | DDC/Architect | Civil, as per CSD | Telecom System contractor |
| 3 | Trench for OFC to be provided with maximum possible route diversity from ramp upto TER | DDC/Architect | Civil, as per CSD | Telecom System contractor |
| 4 | Provision for Telecom Data and Power Cable/Cable tray connectivity to be done in all the utility buildings (All levels) with connectivity from the S&T trench. | DDC/Architect | Civil | Telecom System contractor |
| 5 | Data/Power Tray Riser/Droppers in TER, DCC and other locations to be provided in connectivity of nearby telecom tray provided by E&M | DDC/Architect | E&M | Telecom System contractor |
| 6 | Data/power tray connectivity is to be provided in all the utility building (All levels) as per telecom requirements right from the pull pit connected with the trench. DATA / POWER Cable tray risers / droppers (for trays provided by E&M) to be provided in TER, DCR etc. | DDC/Architect | E&M | Telecom System contractor |
| 7 | Requirement of counter /slab / furniture in Depot Control Room to keep telecom system MMIs of CCTV, Radio, Telephones etc. Requirement of furniture for telecom system in crew control room. | DDC/Architect | Operation | Telecom System contractor |
| 8 | Holes are required on the slab of DCR for Installation of MMIs as per Telecom requirements | DDC/Architect | Finishing | Telecom System contractor |
| 9 | Space for Clean earth (Two locations of 1mx1m Space with 3m separation between these locations) to be provided at ground level near to TER. Location of clean earth pits should be at least 20mts away from main earth pits. Space for clean earth (< 1 ohm) at ground level adjacent to TER and Hume pipe connectivity from TER. | DDC/Architect | Civil | Telecom System contractor |
| 10 | Extension of clean earth (<1 ohm) to be done from Clean Earth Mat location to TER. Copper Bus bar with min.20 holes (10 per row) to be provided in TER. | DDC/Architect | CS12LKS02 | Telecom System contractor |
| 11 | Provision and extension of Main earth (<2 ohm) with copper bus bar with min.20 holes (10 per row) is to be done from pit locations to TER, SER, UPS (S&T) and Depot Control Center. | DDC/Architect | E&M | Telecom System contractor |
| 12 | For Telecom System Equipment (clock, speaker, PID, Telephone, CCTV etc.), conduits with junction / termination / gang box are to be provided as per system requirements in technical / non technical | DDC/Architect | Telecom System contractor | Telecom System contractor |

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| | rooms and also in station areas. These conduits are to be extended from nearest S&T Data / Power trays up to location of the telecom equipments to be installed. Separate conduit for Data and Power cable to be extended | | | |
| 13 | Provision of space is to be done on portals for installation of clock , speakers, CCTV cameras in workshop, inspection bays and stabling yards etc. | DDC/Architect | N.A. | Telecom System contractor |
| 14 | Provision of cable trays connectivity is to be done on portals for installation of clock , speakers, CCTV cameras in workshop, inspection bays and stabling yards etc. | DDC/Architect | E&M | Telecom System contractor |
| 15 | For radio tower, 10x10 sq meter space at road level in vicinity of TER is required for Radio tower installation. Minimum distance from OHE should be 15m. Also 5x50sq meter open space required for assembly of tower and its erection. Hume pipes to be provided from station building up to Tower location with Pull pits as per requirement. At every bend of Hume pipe, pull pit is required | DDC/Architect | Civil, as per CSD | Telecom System contractor |
| 16 | Construction of Tower Foundation, Tower structure, erection of radio Tower, supply and erection of fence, provisioning of radio earth and pits, install radio antenna and feeder cables. | <u>GS14LKS02</u> | <u>GS14LKS02</u> | N.A. |
| 17 | Provision of space for temporary storage of material for telecom contractors in consultation with Civil Deptt. | N.A. | N.A. | Telecom System contractor |
| 18 | Seal the gaps after cable installation work | N.A. | S&T Contractors | Telecom System contractor |
| 4 | General Requirements (For both Underground and Elevated Sections) | | | |
| 1 | Incorporate locations of CCTV cameras, CCTV Monitors clocks, telephones, Public address loudspeakers, Passenger Information Display Boards etc. in drawings. | DDC/Architect | N.A. | Telecom System contractor |