NOIDA METRO RAIL CORPORATION (NMRC) LIMITED

REQUEST FOR PROPOSAL (RFP)

E tender No. NMRC/Lift work/2022/170

Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida.

February 2022

Issued by:

Noida Metro Rail Corporation (NMRC) Limited
Block-III, 3rd Floor,
Ganga Shopping Complex, Sector-29, Noida -201301,
District Gautam Budh Nagar, Uttar Pradesh, India

Disclaimer

This Request for Proposal (RFP) Document (or "E-Tender" or "E-Bid") for "**Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida.** " contains brief information about the scope of work and selection process for the Bidder ('the Contractor" or "the Bidder"). The purpose of the Document is to provide the Bidders with information to assist the formulation of their Bidding Documents.

While all efforts have been made to ensure the accuracy of information contained in this RFP Document, this Document does not purport to contain all the information required by the Bidders. The Bidders should conduct their own independent assessment, investigations and analysis and should check the reliability, accuracy and completeness of the information at their end and obtain independent advice from relevant sources as required before submission of their Bid/s. Noida Metro Rail Corporation Ltd. ("NMRC" or "the Corporation" or "the Employer") or any of its employees or advisors shall incur no liability under any law, statute, rules or regulations as to the accuracy or completeness of the RFP Document.

NMRC reserves the right to change any or all conditions/information set in this RFP Document by way of revision, deletion, updating or annulment through issuance of appropriate addendum as NMRC may deem fit without assigning any reason thereof.

NMRC reserves the right to accept or reject any or all Bids without giving any reasons thereof. NMRC will not entertain or be liable for any claim for costs and expenses in relation to the preparation of the Bid/s to be submitted in terms of this RFP Document.

Glossary

a) "**Addendum / Amendment**" means any written amendment / addendum /corrigendum to this RFP, from time to time issued by NMRC to the prospective bidders
b) **"Agreement"** means the Contract Agreement to be executed between NMRC and the Selected Bidder
c) **"Applicable Laws"** means all the laws including local, state, national or other laws, brought into force and effect by Govt. of India, State Governments, local bodies, statutory agencies and any other, and rules / regulations / notifications issued by them from time to time. It also includes judgments, decrees, injunctions, writs and orders of any court or judicial authority as may be in force and effected from time to time
d) **"Bidder"** or **"Bidder"** means any entity which is a sole proprietorship firm, a partnership firm or a company, in title and assigns which is submitting its bid pursuant to RFP Documents
e) **"Bid Due Date" means** Bid Submission end date and time given in the E-tender
f) **"Earnest Money Deposit (EMD)"** means the refundable amount to be submitted by the Bidder along with RFP documents to NMRC
g) **"NMRC"** means Noida Metro Rail Corporation Limited (or "Corporation" or "Employer")
h) **"Party"** means Contractor or Corporation (together they are called **"Parties"**)
i) **"Performance Bank Guarantee/ Security Deposit"** means interest free amount to be deposited by the Contractor with NMRC as per terms and conditions of Contract Agreement as a security against the performance of the Contract agreement
j) **"Permits"** shall mean and include all applicable statutory, environmental or regulatory Contracts, authorization, permits, consents, approvals, registrations and franchises from concerned authorities
k) **"Re. or Rs. or INR"** means Indian Rupee
l) **"Revenue Operations Date (ROD)"** means the date of operation of Metro
m) **"Selected Bidder"** means the bidder who has been selected by NMRC, pursuant to the bidding process for award of Contract

The words and expressions beginning with capital letters and defined in this document shall, unless repugnant to the context, have the meaning ascribed thereto hereinabove.

Data Sheet

1	Name of the Bid	**RFP for Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida.**
2	Approximate Cost of Work	**Rs.32,52,860.07 (Rupees Thirty two lakh fifty two thousand eight hundred sixty and Seven paise only)** (including GST)
3	Time-period of contract	**4 (Four Months)**
4	Method of selection	Cost Based Selection (Lowest –L1)
5	Bid Processing Fee	INR 5900 (including GST) (Rupees Five Thousand Nine Hundred only) through RTGS/NEFT only payable in favour of Noida Metro Rail Corporation Limited
6	Ernest Money Deposit (EMD)	**INR 65,060/- (Rupees Sixty Five Thousand Sixty only)**
7	Financial Bid to be submitted together with Technical Bid	Yes
8	Name of the Corporation's official for addressing queries and clarifications	DGM/RS, Ops & Elect. Noida Metro Rail Corporation Limited, Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29, Noida 201301 Email: avikdmrc@gmail.com, nmrcrsandel@gmail.com Website: www.nmrcnoida.com, http://etender.up.nic.in
9	Bid Validity Period	180 days
10	Bid Language	English
11	Bid Currency	INR
12	**Schedule of Bidding Process**	
	Head	Key Dates
	Uploading of Bid	28.03.2021
	Pre-bid Meeting	04.04.2022, 1100 hrs (IST)
	Last date of issuing amendment, if any	05.04.2022
	Last Date of Bid Submission	18.04.2022 , 15:00 hrs (IST)
	Date of Technical Bid Opening	19.04.2022, 11:00 hrs (IST)
13	Consortium to be allowed	No
14	Account details	**For Bid Processing Fee & EMD** State Bank of India (04077) – Sector 18, Noida Gautam Budh Nagar, Uttar Pradesh -201301 IFSC Code: SBIN0004077 A/c No. 37707840592 Noida Metro Rail Corporation Ltd.

Note: (i)

Tender Cost and EMD is exempted for Micro & Small Enterprises (MSEs) registered with District Industries Centre or Khadi & Village Industries Commission or Khadi &Village Industries Board or Coir Board or National Small Industries Corporation or Dte. Of Handicraft& Handloom or any other bodies specified by Ministry of Micro, Small &Medium Enterprises for appropriate category and have valid registration certificate as on date of tender submission.
The MSEs would not be eligible for exemption of tender security if:

a. Either they are not registered for appropriate category.

b. Or they do not have valid registration as on the date of tender submission.

The bidders seeking exemption from 'EMD', being MSEs, shall ensure their eligibility w.r.t above and submit registration certificate issued by the body under which they are registered which clearly mentions category of registration i.e. "Electrical work" and Terminal Validity of registration.
In absence of any of the above requirements no exemption for 'EMD' will be allowed and bidders eligibility shall be dealt as if they are not registered with MSMEs.

No further clarification shall be sought on the above.

1. In case the bidder who has been exempted Tender Cost/Tender Security being Micro & Small Enterprise, and;

(i) Withdraws his Tender during the period of Tender validity; or

(ii) Becomes the successful bidder, but fails to commence the work (for whatsoever reasons) as per terms & conditions of Tender; or

(iii) Refuses or neglects to execute the contract; or

(iv) Fails to furnish the required Performance Security within the specified time,

The bidder shall be debarred from participating in future tenders for a period of 1 year from the date of discharge of tender/date of cancellation of NOA/annulment of award of contract as the case may be. Thereafter, on expiry of period of debarment, the bidder may be permitted to participate in the procurement process only on submission of required Tender Cost/ Tender Security. Further the Employer may advise the authority responsible for issuing the exemption certificate to take suitable actions against the bidder such as cancellation of enlistment certificate etc.

Content

1. Section 1: General Information

1.1. Background

a. Noida and Greater Noida are being developed as the satellite towns to New Delhi and an increasing number of people from Delhi and other areas are shifting to these towns in search of fresh air, greenery and better infrastructure. There is a need of providing an efficient, reliable and comfortable transportation system for the population intending to settle in these towns and to the public coming to these areas for education, service and business.

b. Noida Metro Rail Corporation is a Special Purpose Vehicle (SPV) formed by Noida and Greater Noida Authorities for planning and executing urban transport projects in Noida and Greater Noida regions. The Corporation desires to provide a world-class Public Transportation System with state-of-the-art technology. As such, the overarching criterion for setting up of the Corporation is to help create an efficient, safe, reliable, economical and affordable public transport system.

c. NMRC invites E-Bids **Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida.**.

d. In this regard, the Corporation now invites the interested Bidder/s to submit their proposals as per provisions of this RFP Document.

e. NMRC will shortlist the Bidders based on evaluation criteria mentioned in this RFP Document. Based on the minimum evaluation criteria, qualified Bidders will be shortlisted, and Financial proposal of only qualified Bidders will be opened.

1.2. About Metro Locations

The metro corridor is 29.7 km long and is known as Noida Greater Noida Metro Rail Corridor. It comprises 21 metro stations starting from Sector 51 in Noida and ends up at Depot Station in Greater Noida. The map is in Appendix 1: Metro Alignment.

1.3. Communication

All communications should be addressed to -

DGM/RS, Ops & Elect.
Noida Metro Rail Corporation (NMRC) Limited
Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29,
Noida -201301
District Gautam Budh Nagar, Uttar Pradesh
Email: avikdmrc@gmail.com

2. Section 2: Terms of Reference

2.1. Scope of Work

a. The work covered in the tender is as per BOQ placed in section of this RFP

b. The technical specifications are set forth in Technical specifications- Section 6 of this RFP.

c. The bidder should inspect the work site after receiving NOA and obtain for himself at his own responsibility all the information which may be necessary for the purpose of the successful execution of the contract.

d. The bidder shall also make himself conversant with all the local conditions, means of access to the site of work, nature, extent of transport facilities and character of the work and supply of materials, conditions affecting labour and other matters that may affect his tender.

e. The commissioning work of **LIFT** shall be carried out AS PER THE THE TECHNICAL SPECFICATION.

f. The bidder has to obtain scheme approval after the receipt of NOA.

g. The bidder shall complete necessary Electrical/Civil works associated with the installation of Lift such as Cutting /Chipping of RCC and masonry wall/ceiling/earth as required, breaking / making openings as required and mending good the damages and giving final finishing and to match with the existing surface.

h. The final approval shall be obtained from the electrical inspectorate and commissioning shall be done by the bidder.

i. All statutory approval including, electrical inspectorate and regularization from concerned authorities should be carried out by the bidder and all applicable charges to be borne by bidder. If the schematic drawings are requested by the electrical inspectorate or any statutory authority the bidder has to prepare the drawing and to take the approval from EI. The soft and hard copy (Three sets including one plastic/waterproof set) of the said drawing is to be handed over to the tender inviting authority before releasing the final payment**. NOC must be submitted to this office from lift state inspection department and NO extra payment will be released from NMRC for this.**

j. The equipment including the accessories shall be covered under comprehensive warranty period/defect liability period. During this period the successful bidder shall replace all defective parts and attend to all repairs / breakdowns. **The cost of spare parts for all replacements has to be borne by the successful bidder during the period of comprehensive warranty/DLP.**

3. Section 3: Instructions to Bidders

3.1. General instructions

a. A Bidder shall submit only one bid in the same tendering process, either individually as a Bidder or as a partner of a Consortium. A Bidder who submits or participates in more than one bid will cause all the proposals in which the Bidder has participated to be disqualified. No Bidder can be a sub-contractor while submitting a bid individually or as a partner of a Consortium in the same bidding process. A Bidder, if acting in the capacity of subcontractor in any bid, may participate in more than one bid, but only in that capacity.

b. The Bidder shall initiate, and actively pursue and involve itself in all investigations and enquiries, Corporation feedbacks, information, convening of and attendance at meetings, and in any other activities as are or may be necessary for producing high quality work as per the requirements.

c. The Bidder shall carry out the services in compliance with the provisions of this Agreement. All changes necessary to ensure that the Bidder's documents conform to the intent and purpose set out in the Agreement, shall be made at the Bidder's own expense. The Bidder represents that it is a professional and experienced company, and hereby agrees to bear full responsibility for the correctness and technical merit of the services performed.

d. Bidders shall be evaluated based on the Evaluation Criteria specified in this document. Bidders shall be deemed to have understood and agreed that no explanation or justification for any aspect of the Selection Process will be given and that NMRC's decisions are without any right of appeal whatsoever.

e. Any entity which has been barred by the Central/State Government in India or by any entity controlled by them, from participating in any project, and the bar subsists as on the date of Bid, would not be eligible to submit an e - Bid.

f. Bidders are encouraged to inform themselves fully about the assignment and the local conditions before submitting the e-Bid by paying a visit to the Corporation and/or by sending written queries to NMRC before the last date for receiving queries/clarifications.

g. NMRC shall not be liable for any omission, mistake or error on the part of the Bidder in respect of any of the above or because of any matter or thing arising out of or concerning or relating to e-Bid or the Selection Process, including any error or mistake therein or in any information or data given by NMRC.

h. The currency for the Proposal shall be the Indian Rupee (INR).

i. Bidders shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. Bidders shall be considered to have a conflict of interest with one or more parties in this bidding process, if:

    i. A Bidder has been engaged by the Employer to provide consulting services for the preparation related to procurement or implementation of the project;

    ii. A Bidder is any associates/affiliates (inclusive of parent firms) mentioned in subparagraph above; or

    iii. A Bidder lends, or temporarily seconds its personnel to firms or organizations which are engaged in consulting services for the preparation related to procurement for an implementation of the project, if the personnel would be involved in any capacity on the same project.

3.1.1.**Cost of Bid Document / e-Tender processing Fee**

a. The Bidder shall bear all costs associated with the preparation and submission of its e-Bid and Noida Metro Rail Corporation Ltd. ("NMRC" or "the Corporation"), will in no case be responsible or liable for these costs, regardless of the conduct or outcome of the e-Bid process.

a. This tender document is available on the web site http://etender.up.nic.in or on NMRC website (www.nmrcnoida.com) to enable the Bidders to view, download the e-Bid document and submit e-Bids online up to the last date and time mentioned in e-Tender notice/e-tender document against this e-Tender. The Bidders shall have to pay cost of bid document/e-Tender processing fee of as mentioned in **Data Sheet** through RTGS/NEFT only payable in favour of Noida Metro Rail Corporation Limited in the A/c No. mentioned in **Data Sheet**. The scanned copy of RTGS/NEFT receipt with transaction Id certified by the same bank must be enclosed along with the e-Bid. This cost of bid document/e-Tender processing fee as mentioned in **Data Sheet** will be non-refundable. Tender without cost of bid document/e-Tender processing fee in the prescribed form, will not be accepted.

3.1.2. **Acknowledgement by Bidder**

It shall be deemed that by submitting the e-Bid, the Bidder has:

a. made a complete and careful examination of the e-Bid;

b. received all relevant information requested from NMRC;

c. acknowledged and accepted the risk of inadequacy, error or mistake in the information provided in the e-Bid or furnished by or on behalf of NMRC;

d. satisfied itself about all matters, things and information, necessary and required for submitting an informed Application and performance of all its obligations there under;

e. acknowledged that it does not have a Conflict of Interest; and

f. agreed to be bound by the undertaking provided by it under and in terms hereof.

3.1.3. **Availability of Bid Document**

This Bid document is available on the web site http://etender.up.nic.in or on Noida Metro website www.nmrcnoida.com to enable the Bidders to view, download the e-Bid document and submit e-Bids online up to the last date and time mentioned in e-Bidder notice/e-Bid document. The Bidders shall have to pay e-Bid document fee and EMD as mentioned in Data sheet through RTGS/NEFT on addresses given in data sheet. The scanned copy of RTGS/NEFT with transaction ID certified by the same bank must be enclosed along with the e-Bid. This e-Bid document fee will be non-refundable. Bid without Bid fee in the prescribe form will not be accepted.

3.1.4. **Clarifications of e-Bid**

a. During evaluation of e-Bid, NMRC may, at its discretion, ask the Bidder for a clarification of his/her e-Bid. The request for clarification shall be in writing.

Any queries or request for additional information concerning this RFP shall be submitted in writing or by fax and e-mail to the Executive Director, NMRC **only before or during Pre-Bid Meeting** held at NMRC. The envelopes/ communication shall clearly bear the following identification/ title: **"Queries / Request for RFP for Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida.**

b. The responses will be posted to all such queries on the official Website www.nmrcnoida.com. NMRC reserves the right not to respond to any questions or provide any clarifications, in its sole discretion, and nothing in this Clause shall be taken or read as compelling or requiring NMRC to respond to any question or to provide any clarification.

c. A pre-submission meeting shall be called on the date mentioned in **Data Sheet** at NMRC Office. Any change corresponding to date, if any, shall be communicated to the Bidder vide NMRC/ e-Tendering website.

d. In case the Bidder seeks for any queries, he shall send letter or e-mail to the correspondence address given in Data Sheet.

e. However, NMRC shall not entertain any correspondence from the Bidders during the period of e-Bid opening to selection of the successful Bidder. Any wrong practice shall be dealt under Fraud and Corrupt Practices.

f. The Bidder is advised to visit and examine the Site of Works and its surroundings and obtain for himself on his own responsibility all information that may be necessary for preparing the Tender and entering into a contract for the proposed work. The costs of visiting the Site shall be borne by the Bidder. It shall be deemed that the Contractor has undertaken a visit to the Site of Works and is aware of the site conditions prior to the submission of the tender documents.

g. The Bidder and any of his personnel will be granted permission by the Employer to enter upon his premises and lands for the purpose of such inspection, but only upon the express condition that the Bidder, and his personnel, will release and indemnify the Employer and his personnel from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of the inspection.

3.1.5. **Amendment of e-Bid Document**

a. At any time prior to the deadline for submission of e-Bid, NMRC may, for any reason, whether at its on in iterative or in response to a clarification requested by a prospective Bidder, modify the e-Bid document by amendments. Such amendments shall be uploaded on the e-procurement website http://etender.up.nic.in or NMRC's website www.nmrcnoida.com. The relevant clauses of the e-Bid document shall be treated as amended accordingly.

b. It shall be the sole responsibility of the prospective Bidder to check the web site http//etender.up.nic.in or NMRC's website www.nmrcnoida.com from time to time for any amendment in the e-Bid documents. In case of failure to get the amendments, if any, NMRC shall not be responsible for it.

c. In order to allow prospective e-Bids a reasonable time to take the amendment into account in preparing their e-Bids, NMRC, at the discretion, may extend the deadline for the submission of e-Bids. Such extensions shall be uploaded on the e-procurement website http://etender.up.nic.in or NMRC's website www.nmrcnoida.com.

3.2. Preparation and submission of Bids

3.2.1. **Language of e-Bid**

The e-Bid prepared by the Bidder, as well as all correspondence and documents relating to the e-Bid exchanged by the Bidder and NMRC shall be written in English language. Only English numerals shall be used in the e-Bid. The correspondence and documents in any other language must be accompanied by transcripts verified by the Embassy of Home Country or equivalent.

3.2.2. **Documents constituting the e-Bid**

The e-Bid prepared by the Bidder shall comprise the following components:

a. Technical e-Bid- Technical e-Bid will comprise of -

iv. **Fee details -** Details of Bid processing fee and prescribed EMD

v. **Eligibility details -** Includes copies of required documents in PDF format justifying that the Bidder is qualified to perform the contract if his/her bid is accepted and the Bidder has financial & technical capability necessary to perform the contract and meets the criteria outlined in the Qualification requirement and technical specification and fulfil all the conditions of the contract.

vi. **Technical evaluation -** Details of all documents needed for Technical evaluation as mentioned in this RFP

b. Financial e-Bid -

i. **Price bid –** Bill of Quantities in XLS format to be filled in after downloading from the e-Procurement website for this e-tender. There shall be a single quote.

3.2.3. **Documents establishing Bidder's Qualification**

a. The Bidder shall furnish, as part of its technical e-Bid, documents establishing the Bidder's qualification to perform the contract if its e-Bid is accepted. The documentary evidence should be submitted by the Bidder electronically in the PDF format.

b. The documentary evidence of Bidder's qualification to perform the contract if its e-Bid is accepted shall be as per qualification requirements specified in e-Bid document.

3.2.4. **E-Bid form**

The Bidder shall complete the e-Bid form and the appropriate price schedule/BOQ furnished in the e-Bid document.

3.2.5. **E-Bid Currency**

Prices shall be quoted in Indian Rupees only.

3.2.6. **Formats and Signing of e-Bid**

a. The Bidder shall prepare one electronic copy of the technical e-Bid and financial e-Bid separately.

b. The e-Bid document shall be digitally signed, at the time of uploading, by the Bidder or a person or persons duly authorized to bind the Bidder to the contract. The later authorization shall be indicated by a scanned copy of written power-of attorney accompanying the e-Bid. All the pages/documents of the e-Bid that are to be uploaded shall be digitally signed by the person authorized to sign the e-Bid.

c. Bidders should provide all the information as per the RFP and in the specified formats. NMRC reserves the rights to reject any proposal that is not in the specified formats.

d. In case the Bidders intends to provide additional information for which specified space in the given format is not sufficient, it can be furnished in duly stamped and signed PDFs.

3.2.7. **Deadline for submission of e-Bid**

E-Bid (Technical and financial) must be submitted by the Bidder at e-procurement website http://etender.up.nic.in not later than the time specified on the prescribed date (as the server time displayed in the e-procurement website). NMRC may, at its discretion, extend this deadline for submission of e-Bid by amending the e-Bid document, in which case all rights and obligations of NMRC and Bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

3.2.8. **Submission of e-Bid**

a. The bid submission module of e-procurement website http://etender.up.nic.in enables the Bidders to submit the e-Bid online in response to this e-Bid published by NMRC.

b. Bid submission can be done only from the bid submission start date and time till the bid submission end date and time given in the e-Bid. Bidders should start the bid submission process well in advance so that they can submit their e-Bid in time.

c. The Bidder should submit their e-Bid considering the server time displayed in the e- procurement website. This server time is the time by which the e-Bid submission activity will be allowed till the permissible time on the last/end date of submission indicated in the e-Bid schedule.

d. Once the e-Bid submission date and time is over, the Bidders cannot submit their e-Bid. For delay in submission of e-Bid due to any reasons, the Bidders shall only be held responsible.

The Bidders have to follow the following instructions for submission of their e-Bid:

a. For participating in e-Bid through the e-Biding system it is necessary for the Bidders to be the registered users of the e-procurement website http://etender.up.nic.in. The Bidders must obtain a user login Id and password by registering themselves with U.P. Electronics Corporation Ltd., Lucknow if they have not done so previously for registration.

b. In addition to the normal registration, the Bidder has to register with his/her digital signature certificate (DSC) in the e-Biding system and subsequently he/she will be allowed to carry out his/her e-Bid submission activities. Registering the digital signature certificate (DSC) is a one-time activity. Before proceeding to register his/her DSC, the Bidder should first log on to the e-Biding system using the user login option on the home page with the login Id and password with which he/she has registered.

For successful registration of DSC on e-procurement website http://etender.up.nic.in the Bidder must ensure that he/she should possess class-2/class-3 DSC issued by any certifying authorities approved by controller of certifying authorities, Government of India, as the e-procurement website http://etender.up.nic.in is presently accepting DSC issued by these authorities only. The Bidder can obtain user login Id and perform DSC registration exercise given above even before the e-Bid submission date starts. NMRC shall not be held responsible if the Bidder tries to submit his/her e-Bid at the moment before end date of submission but could not submit due to DSC registration problem.

c. The Bidder can search for active Bids through "search active tenders" link, select a Bid in which he/she is interested in and then move it to 'My Tenders' folder using the options available in the e-Bid submission menu. After selecting and the Bid, for which the Bidder intends to e-Bid, from "My tenders" folder, the Bidder can place his/her e-Bid by clicking "pay offline" option available at the end of the view Bid details form. Before this, the Bidder should download the e-Bid document and price schedule/bill of quantity (BOQ) and study them carefully. The Bidder should keep all the documents ready as per the requirements of e-Bid document in the PDF format except the price schedule /bill of quantity (BOQ) which should be in the XLS format (excel sheet).

d. After clicking the 'pay offline' option, the Bidder will be redirected to terms and conditions page. The Bidder should read the terms & conditions before proceeding to fill in the Bid fee and EMD offline payment details. After entering and saving the Bid fee and EMD details form so that "bid document preparation and submission" window appears to upload the documents as per technical (fee details, qualification details, e-Bid form and technical specification details) and financial (e-Bid form and price schedule/BOQ) schedules/packets given in the Bid details. The details of the RTGS/NEFT should tally with the details available in the scanned copy and the date entered during e-Bid submission time otherwise the e-Bid submitted will not be accepted.

e. Next the Bidder should upload the technical e-Bid documents for fee details (e-Bid fee and EMD), Qualification details. Before uploading, the Bidder has to select the relevant digital signature certificate. He may be prompted to enter the digital signature certificate password, if necessary. For uploading, the Bidder should click "browse" button against each document label in technical and financial schedules/packets and then upload the relevant PDF/XLS files already prepared and stored in the Bidder's computer. The required documents for each document label of technical (fee details, qualification details, e-Bid form and technical specification details) and financial (e-Bid form and price schedule/BOQ) schedules/packets can be clubbed together to make single different files for each label.

f. The Bidder should click "Encrypt" next for successfully encrypting and uploading of required documents. during the above process, the e-Bid documents are digitally signed using the DSC of the Bidder and then the documents are encrypted/locked electronically with the DSC's of the bid openers to ensure that the e-Bid documents are protected, stored and opened by concerned bid openers only.

g. After successful submission of e-Bid document, a page giving the summary of e-Bid submission will be displayed confirming end of e-Bid submission process. The Bidder can take a printout of the bid summary using the "print" option available in the window as an acknowledgement for future reference.

h. NMRC reserves the right to cancel any or all e-Bids without assigning any reason.

3.2.9. **Late e-Bid**

a. Bids received by NMRC after the specified time on the Bid Due Date shall not be eligible for consideration and shall be summarily rejected.

b. The server time indicated in the bid management window on the e-procurement website http://etender.up.nic.in will be the time by which the e-Bid submission activity will be allowed till the permissible date and time scheduled in the e-Bid.

c. Once the e-Bid submission date and time is over, the Bidder cannot submit his/her e-Bid. Bidder has to start the bid submission well in advance so that the submission process passes off smoothly. The Bidder will only be held responsible if his/her e-Bid is not submitted in time due to any of his/her problems/faults, for whatsoever reason, during e-Bid submission process.

3.2.10. **Withdrawal and resubmission of e-Bid**

a. At any point of time, a Bidder can withdraw his/her e-Bid submitted online before the bid submission end date and time. For withdrawing the Bidder should first log in using his/her login id and password and subsequently by his/her digital signature certificate on the e-procurement website http://etender.up.nic.in. The Bidder should then select "My bids" option in the bid submission menu. The page listing all the bids submitted by the Bidder will be displayed. Click "View" to see the details of the bid to be withdrawn. After selecting the "bid withdrawal" option the Bidder has to click "Yes" to the message "Do you want to withdraw this bid?" displayed in the bid information window for the selected bid. The Bidder also has to enter the bid withdrawing

reasons and upload the letter giving the reasons for withdrawing before clicking the "Submit" button. The Bidder has to confirm again by pressing "OK" button before finally withdrawing his/her selected e-Bid.

b. No e-Bid may be withdrawn in the interval between the deadline for submission of e-Bids and the expiration of period of e- bid validity. Withdrawal of an e-Bid during this interval may result in the forfeiting of Bidder's e-Bid security.

c. The Bidder can re-submit his/her e-Bid as when required till the e-Bid submission end date and time. The e-Bid submitted earlier will be replaced by the new one. The payment made by the Bidder earlier will be used for revised e-Bid and the new e-Bid submission summary generated after the successful submission of the revised e-Bid will considered for evaluation purposes. For resubmission, the Bidder should first log in using his/her login Id and password and subsequently by his/her digital signature certificate on the e-procurement website http://etender.up.nic.in. The Bidder should then select "My bids" option in the bid submission menu. The page listing all the bids submitted by the Bidder will be displayed. Click "View" to see the detail of the e-Bid to be resubmitted. After selecting the "bid resubmission" option, click "Encrypt & upload" to upload the revised e-Bids documents.

d. The Bidder can submit their revised e-Bids as many times as possible by uploading their e-Bid documents within the scheduled date & time for submission of e-Bids.

e. No e-Bid can be resubmitted subsequently after the deadline for submission of e-Bids.

3.2.11. **NMRC's right to accept any e-Bid and to reject any or all e-Bids.**

a. Notwithstanding anything contained in this e-Bid, NMRC reserves the right to accept or reject any Bid and to annul the Selection Process and reject all Bids, at any time without any liability or any obligation for such acceptance, rejection or annulment, and without assigning any reasons thereof.

b. NMRC reserves the right to reject any Bid if:

- At any time, a material misrepresentation is made or uncovered, or
- The Bidder does not provide, within the time specified by NMRC, the supplemental information sought by NMRC for evaluation of the e-Bid.

c. Such misrepresentation/ improper response may lead to the disqualification of the Bidder. If such disqualification /rejection occurs after the e-Bid have been opened and the highest-ranking Bidder gets disqualified / rejected, then the NMRC reserves the right to consider the next best Bidder, or take any other measure as may be deemed fit in the sole discretion of NMRC, including annulment of the Selection Process.

3.2.12. **Period of validity of e-Bid**

a. e-Bid shall remain valid for 180 days after the date of e-Bid opening prescribed by NMRC. An e-Bid valid for a shorter period shall be rejected by NMRC as non-responsive.

b. In exceptional circumstances, NMRC may solicit the Bidder's consent to an extension of the period of e-Bid validity. The request and the response thereto shall be made in writing.

3.2.13. **Correspondence with the Bidder**

a. Save and except as provided in this e-Bid, NMRC shall not entertain any correspondence with any Bidder or its Technical Partners in relation to acceptance or rejection of any e-Bid.

b. Subject to Clause 3.4.5 no Bidders or its Technical Partners shall contact NMRC on any matter relating to his e-Bid from the time of Bid opening to the time contract is awarded.

c. Any effort by the Bidder or by its Technical Partners to influence NMRC in the Bid evaluation, Bid comparison or contract award decisions, may result in the rejection of his Bid.

3.3. Earnest Money Deposit

3.3.1. **Earnest money deposit (EMD)**

a. The Bidder shall furnish, as part of its e-Bid, an e-Bid security/ EMD as stated in Data Sheet in form of RTGS/NEFT only in favour Noida Metro Rail Corporation Limited in the A/c No. mentioned in **Data Sheet**. The scanned copy of RTGS/NEFT receipt of Security/ EMD with transaction Id certified by the same bank must be enclosed along with the e-Bid. Tender without Earnest Money in the prescribed form, will not be accepted.

b. Any e-Bid not secured in accordance with above shall be treated as non-responsive and rejected by NMRC.

c. Unsuccessful Bidder's EMD will be returned within 45 days of opening of the Price Bid in case of Conclusion or discharge of the tender.

d. No interest will be paid by the Employer on the Earnest Money Deposit.

e. The successful Bidder's e-Bid EMD will be adjusted with Performance Bank Guarantee, if applicable, to be submitted by the Bidder upon signing the contract.

f. The EMD may be forfeited:

   i. If Bidder (a) withdraws its e-Bid during the period of e-Bid validity specified by the Bidder on the e- bid form: or (b) does not accept the correction of errors or (c) modifies its e-Bid price during the period of e-Bid validity specified by the Bidder on the form.

   ii. In case of a successful Bidder, if the Bidder fails to sign the contract with the Corporation.

3.4. Opening and Evaluation of Bids

3.4.1. **Opening of technical e-Bid by NMRC**

a. NMRC will open all technical e-Bids, in the presence of Bidder`s representatives who choose to attend on the prescribed date of opening at NMRC Office. The Bidder's representatives who are present shall submit the letter to NMRC on the letter head of the company stating that the representative (name) is authorized to attend the meeting (Please note – The representative is required to carry a copy during pre-bid and other related meetings as well). He / She shall sign a register evidencing their attendance at NMRC. In the event of the specified date e-Bid opening being declared a holiday for the Corporation, the e –bids shall be opened at the appointed time and place on the next working day.

b. The Bidder who is participating in e-Bid should ensure that the RTGS/NEFT of Bid Processing Fee and EMD must be submitted in the prescribed account of NMRC within the duration (strictly within opening & closing date and time of individual e-Bid) of the work as mentioned in Bid notice, otherwise, in any case, e-Bid shall be rejected.

c. The Bidders names and the presence or absence of requisite e-Bid security and such other details as NMRC at its discretion may consider appropriate, will be announced at the opening.

3.4.2. **Opening of financial e-Bid**

a. After evaluation of technical e-Bid, through the evaluation committee NMRC shall notify those Bidders whose technical e-Bids were considered non-responsive to the conditions of the contract and not meeting the technical specifications and qualification requirements indicating that their financial e-Bids will not be opened.

b. NMRC will simultaneously notify the Bidders, whose technical e-Bids were considered acceptable to the Corporation. The notification may be sent by e-mail as provided by Bidder.

c. The financial e-Bids of technically qualified Bidders shall be opened in the presence of technically qualified bidders who choose to attend. The date and time for opening of financial bids will be communicated to the technically qualified Bidders subsequently after completion of technical bids evaluation through e-mail provided by the Bidder.

3.4.3. **Correction of Errors**

a. Financial Bids determined to be responsive will be checked by NMRC for any arithmetic errors. Where there is a discrepancy between the rate quoted in the Financial Bid, in figures and in words, the amount in words will prevail over the amounts in figures, to the extent of such discrepancy.

b. The amount stated in the Financial Bid will be adjusted by NMRC in accordance with the above procedure for the correction of errors and shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected quoted rate of e-Bid, his e-Bid will be rejected, and his Bid Security shall be liable for forfeiture in accordance with Clause 3.3.1f

3.4.4. **Examination of e-Bid document**

a. The NMRC will examine the e-Bid to determine if:

   i. They are complete;

   ii. They meet all the conditions of the contract;

   iii. The required e-Bid Processing fee, EMD and other required documents have been furnished;

   iv. The documents have been properly digitally signed; and

   v. The e-Bids are in order.

b. Any e-Bid or e-Bids not fulfilling these requirements shall be rejected.

3.4.5. **Contacting NMRC**

a. No Bidder shall contact NMRC on any matter relating to his/her e-Bid, from the time of the e-Bid opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of NMRC, he/she can do so in writing.

b. Any effort by a Bidder to influence NMRC in its decisions on e-Bid evaluation, e- bid comparison or contract award may result in rejection of the Bidder's e-Bid.

c. In the event of any information furnished by the Bidder is found false or fabricated, the minimum punishment shall be debarring /blacklisting from Noida Metro works and legal proceeding can also be initiated. EMD of such bidders will be forfeited.

3.4.6. **Confidentiality**

a. Information relating to the examination, clarification, evaluation, and recommendation for the Bidders shall not be disclosed to any person who is not officially concerned with the process or is not a retained professional advisor advising NMRC in relation to or matters arising out of or concerning the Bidding Process. Any effort by a Bidder to exert undue or unfair influence in the process of examination, clarification, evaluation and comparison of Proposal shall result in outright rejection of the offer, made by the said Bidder.

b. NMRC shall treat all information, submitted as part of Bid, in confidence and shall require all those who have access to such material to treat the same in confidence. NMRC may not divulge

any such information unless it is directed to do so by any statutory entity that has the power under law to require its disclosure or is to enforce or assert any right or privilege of the statutory entity and/ or NMRC or as may be required by law or in connection with any legal process.

3.5. Award of Contract

3.5.1. **Award Criteria**

a. NMRC will award the contract as per evaluation criteria stated in the RFP Document.

b. NMRC will award the contract to the successful Bidder whose bid has been determined to be responsive to all the conditions of the contract and meeting the eligibility requirement of the bidding document.

3.5.2. **Notice of Award (NOA)**

a. Prior to the expiration of the period of e-Bid validity, NMRC will notify the successful Bidder in writing, by letter/e-mail/fax, that its e-Bid has been accepted.

b. The acceptance of NOA will constitute the formation of the contract.

3.5.3. **Signing of contract**

At the same time as NMRC notifies the successful Bidder that it's e-Bid has been accepted, the successful Bidder shall have to sign the contract agreement with relevant document as mentioned in the RFP. The agreement draft along with other related terms and conditions will be same as furnished in this e-Bid. Any refusal will not be allowed. The Bidder need not download and submit in hard copies of these documents.

3.5.4. **NMRC's right to accept any e-Bid and to reject any or all e-Bids**

NMRC reserves the right to accept or reject any e-Bid, and to annul the e-Bid process and reject all e-Bids at any time prior to contract award, without thereby incurring any liability to the affected Bidder or Bidders.

4. Section 4: Qualification, Evaluation and Selection Process

4.1. Eligibility Criteria

The Bidder's competence and capability is proposed to be established by the following parameters. The Bidder should meet all the criteria given in this section.

a. Sole proprietorship, registered partnership firm, public limited company, private limited company of any of the above can submit the Bidder. The firms and the companies should be registered in India.

b. The Bidder should have a minimum experience of having satisfactorily completed similar works during last 7 (Seven) years period ending last day of month before the one in which the bids are invited should be either of the following:

   i. One similar completed work costing not less than the amount equal to **Rs. 27 Lakh** (Rupees Twenty Seven Lacs only) or

   ii. Two similar completed works each costing not less than the amount equal to **Rs. 17.00 Lakh** (Rupees Seventeen Lacs only) or

   iii. Three similar completed works each costing not less than the amount equal to **Rs. 14.00 Lakh** (Rupees Fourteen Lacs only)

   Similar work" for this contract shall be "Work of Installation and commissioning of Lift set/ or Lift set with associated electrical and civil work" in any Central Govt./ State Govt./ PSU or any Private Limited company of repute.

c. The Bidder should have minimum **average annual turnover** of **Rs. 27 Lakh (Rupees Twenty Seven Lacs only)** in the last 3 (three) Financial Years **(2018-19, 2019-20, 2020-21)** preceding the Bid Due Date.

d. T1 – Liquidity
   NA

e. T2 – Profitability:
   Profit before Tax should be positive during immediately preceding , three financial years audited years.

f. T3 – Net Worth:
   NA

g. The Bidder should not have been blacklisted/ banned/ declared ineligible for corrupt and fraudulent practices by the Government of India/ any State Government/ Government Agency and Supreme court and contracts have been terminated/ foreclosed by any company / department due to non- fulfilment of Contractual obligation in last 5 (five) financial years.

JV not allowed

The Bidder shall also furnish the following documentary proof (for all members in case of Consortium, as per eligibility criteria):

a. For above criteria 4.1a
   i. Statutory proof of existence as the legal entity
   ii. PAN certificate as per legal entity

b. For above criteria 4.1b

   i. Form 4: Work Experience with documentary evidence as mentioned in the Form

c. For above criteria 4.1c
   i. Form 5: Financial Capability Details
   ii. A copy of the Audited balance sheets and Profit and Loss Statements for the last 3 (Three) financial years

   In case the Financial Statements for the latest financial year are not audited and therefore the Bidder cannot make it available, the Bidder shall give an undertaking to this effect and the statutory auditor/chartered accountant shall certify the same. In such a case, the Bidder shall provide the Audited Financial Statements for 2 (two) years preceding the year for which the Audited Financial Statement is not being provided. Also, pertaining to latest financial year, the bidder shall submit an affidavit certifying that "The Annual Accounts have not been audited so far which is certified by CA also."
   iii. Self-attested copy of ITR of last three year.

d. For above criteria 4.1g
   i. Form 7: Undertaking

4.2. Bid Capacity Criteria:

Bid Capacity: The Bidders will be qualified only if their available bid capacity is more than the approximate cost of work as per NIT. Available bid capacity will be calculated based on the following formula:
Bid capacity will be calculated based on the following formula:
Available Bid Capacity = 2*A*N – B
Where,
A = Maximum of the value of work executed in any one year during the last three financial years (updated to the last day of the previous month of tender submission price level assuming 5% inflation for Indian Rupees every year and 2% for foreign currency portions per year).
N = No. of years prescribed for completion of the work
B = Value of existing commitments (as on the last day of the previous month of tender submission) for on-going works during period of **4** months w.e.f. from the first day of the month of tender submission.

Financial data for latest last three financial years has to be uploaded by the Bidder in Form-5 of Tender along with audited financial statements. The financial data in the prescribed format shall be certified by the Chartered Accountant with his stamp and signature in original along with UDIN and membership number.

Value of existing commitments for on-going works during period of 4 (Four Months)w.e.f. from the first day of the month of tender submission has to be uploaded by the Bidder in Form-4 of Tender. These data shall be certified by the Chartered Accountant with his stamp and signature in original along with UDIN and membership number.

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4.3. Personnel

The Bidder shall submit - Form 13: Undertaking pertaining to Personnel a staffing schedule containing the names, qualifications, professional experience and corporate affiliation of all proposed management personnel (above the level of shift supervisor) and specialists for this work.

The submission shall include a provisional management structure and organisation chart showing areas of responsibility, relative seniorities and lines of reporting.

RESOURCES PROPOSED FOR THE PROJECT – PERSONNEL

The figures indicated below are the minimum number of Project-Personnel required which are to be deployed as per the minimum level of supervision and qualification/experience of site staff is given as follows:

S. No.	Designation of Project Personnel	Minimum Requirement
1	Civil Engineer/Site Engineer	1
2	Supervisor Civil, Electrical	2 (One for each department)
3	Bill Engineer	1

It is to be noted that:

i. The contractor shall deploy resources as per the above mentioned minimum requirement and also confirm to deploy manpower over and above the minimum numbers indicated above, if the work requires so.
ii. These minimum resources are as per the requirements of the various activities at different stages of works. All resources need not to be mobilized simultaneously, resources as per the requirement of various stages of works shall be mobilized in accordance with the instructions of the Engineer. The decision of the Engineer shall be final and bonding.
iii. The performance of project personal deployed will be evaluated periodically by Employer during the contract period. In case the performance of any of the personnel is not satisfactory, the contractor shall replace them with good personnel immediately as per the directions of the Engineer.
iv. If staff is absent or found missing from his duty, recovery @ ₹2000/- for supervisor and @ ₹3000/- for engineer per day shall be imposed on the contractor and to be recovered from the running bill of the contractor.

MINIMUM ORGANISATION STRUCTURE REQUIRED

Minimum level of supervision & qualification/ experience of site staff is as follows:

S. No.	DESIGNATION	QUALIFICATION	EXPERIENCE LEVEL
1.	Civil Engineer/Site Engineer	Graduate/ B. Tech in Civil Engineering	Total minimum experience of 05 years for Degree and 8 years for Diploma.
2.	Supervisor	Diploma in Civil Engineering, Electrical Engineering,	Total minimum

		Telecommunication	experience of 05 years.
3.	Bill Engineer	Diploma in Civil Engineering/ Quantity Surveying	Minimum 3 year experience

4.4. Compliance with Technical Specifications

The Bidders must comply with the stipulated technical specifications as mentioned in the tender documents

4.5. Information of the Technical and Financial Proposal

a. The Bidder satisfying technical and financial eligibility criteria under Clause 4.1 shall be considered as technically and financially qualified.

b. The financial proposal of only technically qualified Bidders shall be opened for evaluation.

c. The Bidder with the lowest quoted price for the RFP for **Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida** in the financial quote **(L1 bidder)** shall be selected for the award of contract.

4.6. Selection of Bidder

After the above evaluation process, the Technically Qualified Bidder, who is declared as **L1 (lowest quoted price)** may be declared as the selected Bidder ("Selected Bidder") for the Project.

a. In case, two or more technically qualified bidders quote the same rate in the Commercial Bid, and become Lowest (i.e. L-1), then the tender would be awarded to the bidder who has the highest / higher Average Annual Turnover from 'Similar Works' (as per Minimum Eligibility Criteria defined in Section 4 under "Definition of Similar Work") during the last 3 years ending on the last day of the month preceding the month in which the tender has been floated. Experience certificate / work completion certificate on client's letter head is mandatory to ascertain the nature, period and value of work which shall be required to be uploaded by the bidder by the last date of tender submission. Prior to the expiry of the period of bid validity, NMRC will notify the successful bidder in writing, either through Notice of Award (NOA), that his bid has been accepted.

b. Prior to the expiry of the period of bid validity, NMRC will notify the successful bidder in writing, either through Notice of Award (NOA), that his bid has been accepted.

c. The NOA would be sent in duplicate to the successful bidder, who will return one copy to NMRC duly acknowledged, signed and stamped by the authorized signatory of the bidder, as an unconditional acceptance of the NOA, within 10 (ten) days from the date of issue of NOA.

d. No correspondence will be entertained by NMRC from the unsuccessful bidders.

4.7. Notice of Award and Execution of Contract Agreement

a. NMRC will notify the Successful Bidder by a Notice of Award (NOA) that its bid has been accepted.

b. The Selected Bidder shall, within 10 (ten) days of the receipt of the NOA, sign and return the duplicate copy of the NOA in acknowledgement thereof along with letter of acceptance of NOA. In the event, the duplicate copy of the NOA duly signed by the Selected Bidder and letter of acceptance of NOA is not received by the stipulated date, NMRC may, unless it consents to

extension of time for submission thereof, appropriate the Bid Security of such Bidder as mutually agreed genuine pre-estimated loss and damage suffered by NMRC because of failure of the Selected Bidder to acknowledge the NOA

c. The Successful Bidder shall execute the Contract Agreement within 15 (fifteen) days of the letter of acceptance of NOA or such extended period as may be decided by the Corporation.
d. Failure of the Successful Bidder to comply with the requirement of acknowledgement of NOA shall constitute sufficient grounds for the annulment of the NOA, and forfeiture of the bid security.
e. The Purchaser reserves the right to increase or decrease the quantity up to 25% of the quantity offered by the successful Bidder. The bidder is bound to accept the increase or decrease in the tendered quantity up to 25% under this clause without any change in unit price.
   In case the variation in individual items or the group of items as stipulated above, is more than 25% on plus side, the rate for the varied quantity beyond 25% shall be negotiated between NMRC and the Contractor and mutually agreed rates arrived at before actual execution of the extra quantity. In case the contractor executes the extra quantity without written approval of the NMRC with specific instructions to execute pending the finalization of rates, the payment shall be made at contract rate only. In the event of disagreement, the Engineer shall fix such rates of price as are, in his opinion appropriate and shall notify the Contractor accordingly, with a copy to the Employer. Until such time as rates or prices are agreed or fixed, the Engineer shall determine provisional rates or prices to enable on account payments to the Contractor. Alternatively, in the event of disagreement, the Contractor shall have no claim to execute extra quantities/new items and the Engineer shall be free to get such additional quantities beyond 25% new items executed through any other agency. However, if the Engineer or the Employer so directs the Contractor shall be bound to carry out any such additional quantities beyond the limits stated above original quantities and or new items and the disagreement or the difference regarding rates to be paid for the same shall be settled in the manner laid down under the conditions for the settlement of dispute.

4.8. Performance Bank Guarantee / Security Deposit

a. To fulfil the requirement of performance bank guarantee during the implementation period, the Successful Bidder (herein referred to as the "Contractor") shall deposit **10% of the Contract Price** in form of FDR/ DD or unconditional and irrevocable Bank Guarantee bond issued by a scheduled bank in favour of Noida Metro Rail Corporation Limited, which may be reduced for balance years on completion of each year, within 30 days from Notice of Award. EMD amount of successful bidder shall be adjusted in the performance bank guarantee, if applicable. For unsuccessful bidder, EMD shall be refunded without any interest. The Performance Guarantee should be valid for a period of ***six month beyond the Defect Liability Period*** and will be released after successful completion of Defect Liability Period and submission of needful documents. The Bank guarantee must be issued by a bank branch located in Delhi NCR, Noida and Greater Noida region only. The Bank guarantee shall be extended and renewed in advance before the expiry of existing bank in favour of Noida metro rail corporation limited.
b. It is to note that if contract value increases by more than 25% of the original contract value, the performance bank guarantee shall be increased accordingly.
c. A Contract agreement will have to be signed by the Contractor at his cost on proper stamp paper. Without performance guarantee by Contractor, Contract agreement shall not be signed.
d. NMRC reserves the right for deduction of NMRC dues from Contractor's Performance Bank Guarantee/ Security Deposit (interest free) for – Any penalty imposed by NMRC for violation of any terms and conditions of agreement committed by the Contractor.
e. Any amount which NMRC becomes liable to the Government/Third party due to any default of the Contractor or any of his director/ employees/ representatives/ servant/ agent, etc.

f. Any payment/ fine made under the order/judgment of any court/consumer forum or law enforcing Contractor or any person duly empowered in his behalf.

g. Any outstanding payment/ claims of NMRC remained due after completion of relevant actions as per agreement.

h. Once the amount under above Clause is debited, the Contractor shall replenish the Security Deposit/ Performance Bank Guarantee to the extent the amount is debited within 15 days period, failing which, it shall be treated as Contractor Event of Default and will entitle NMRC to deal with the matter as per the provisions of RFP and Contract Agreement.

4.9. Contract during Proposal Evaluation

a. Proposals shall be deemed to be under consideration immediately after they are opened and until such time NMRC makes official intimation of award/ rejection to the Bidders. While the Proposals are under consideration, Bidders and/ or their representatives or other interested parties are advised to refrain from contacting by any means, NMRC and/ or their employees/ representatives on matters related to the Proposals under consideration till the time Contract is awarded.

b. Any effort by a Bidder to influence NMRC in its decisions on e-Bid evaluation, e-Bid comparison or contract award may result in rejection of the Bidder's e-Bid.

c. In the event of any information furnished by the Contractor is found false or fabricated the minimum punishment shall be debarred/ blacklisting and the legal proceeding may also be initiated.

d. If the Bidder wishes to bring additional information to the notice of NMRC, he/she can do so in writing. All correspondence/ enquiry should be submitted to the following in writing by fax/ post/courier:

DGM (RS, Ops & Elect)
Noida Metro Rail Corporation (NMRC) Limited
Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29,
Noida -201301
District Gautam Budh Nagar, Uttar Pradesh
Email: avikdmrc@gmail.com

e. No interpretation, revision, or other communication from NMRC regarding this solicitation is valid unless in writing and signed by the competent authority from NMRC.

4.10. Other Instruction

a. Canvassing in connection with the tenders is strictly prohibited and the tenders, submitted by Bidder, who resort to canvassing, are liable to be rejected. EMD will be forfeited of those tenders who will be found non-serious and if it is felt by the tender committee that the Bidders submitted their tender only to influence the tendering process.

b. On acceptance of the tender, the name of the accredited representative of the Contractor, who would be responsible for taking instructions from NMRC or the official deputed by NMRC, shall be communicated to NMRC or the official deputed by NMRC in writing.

4.11. Project Financial Terms

4.11.1. Payment Terms

The following percentage of contract rates for the various items included in the contract shall be payable against the stage of work shown herein.

a. 60% for **lift** after initial inspection and delivery at site in good condition of pro-rata basis.

b. 20% after installation of Lift.

c. Balance 20% will be paid after testing, commissioning trail run & handing over to the department for beneficial use.

d. Rest work executed against the BOQ items in would be paid on measurement basis.

e. The Contractor may raise their 'On Account'' payments on monthly basis as per the status of work on the last day of the respective month.

4.12. Completeness of tender:

I. All sundry equipment, fittings, unit assemblies, accessories, hardware items, foundation bolts, termination lugs for electrical connections, and all other items which are useful and necessary for efficient assembly and installation of equipment and components of the work shall be deemed to have been included in the tender irrespective of the fact whether such items are specifically mentioned in the tender documents or not.

II. For item/equipment requiring initial inspection at manufacturer's works, the contractor will intimate the date of testing of equipment's at the manufacturer's works before dispatch. The department also reserves the right to inspect the fabrication job at factory and the successful tenderer has to make the arrangement for the same. The successful tenderer shall give sufficient advance notice regarding the dates proposed for such tests/inspection to the department's representative(s) to facilities his presence during testing/fabrication. The Engineer-in-charge at his discretion may witness such testing/fabrication. The cost of the Engineer's visit to the factory will be borne by the department. Also equipment may be inspected at the manufacturer's premises, before dispatch to the site by the contractor**.**

4.13. Contractor's Labour Camp

4.13.1. **Employer not to provide Quarters for Contractor's Labour**

The Employer will not provide living accommodation for the use of the Contractor or any of his staff or labour employed on the Works. Living accommodation shall not be established on any land provided to the contractor by the Employer.

4.13.2. **Provision of Labour Camp**

The Contractor, shall, at his own expense, make adequate arrangements for the housing, supply of drinking water and provision of bathrooms, latrines and urinals, with adequate water supply, for his staff and workmen directly or through sub-contractors employed on the Works at the location authorised by Engineer. No labour camp shall be allowed at work site or any unauthorised place. The Contractor at his own cost shall maintain all campsites in a clean and sanitary condition. The Contractor shall obey all health and sanitary rules and regulations and carry out at his cost all health and sanitary measures that may, from time to time, be prescribed by the Local/Medical Authorities and permit inspection of all health and sanitary arrangements at all times by the Employer, Engineer and the staff of the local municipality or other authorities concerned. Should the Contractor fail to provide adequate health and sanitary arrangements these shall be provided by the Employer and the cost recovered from the Contractor. The Contractor shall at his own cost, provide First Aid and Medical facilities at the Labour Camp and at work sites on the advice of the Medical Authority in relation to the strength of the Contractor's staff and workmen, employed directly or through sub-contractors. The Contractor shall at his own cost, provide the following minimum requirements for fire precautions:

- Portable Fire Extinguishers

The Contractor at his own cost shall provide necessary arrangements for keeping the camp area sufficiently lighted to avoid accidents to the workers. He should also ensure that electrical installations are done by Trained Electricians. These installations shall be maintained, and daily maintenance records must be made available for inspection of the Engineer.

4.13.3. **Camp Discipline**

The Contractor shall take requisite precautions and use his best endeavours to prevent any riotous or unlawful behaviour by or amongst his workmen, and others, employed directly or through sub-contractors. These precautions shall be for the preservation of the peace and protection of the inhabitants and security property in the neighbourhood of the Works. In the event of the Employer requiring the maintenance of a Special Police Force at or near the site, during the tenure of the work, the expenses thereof shall be borne by the Contractor and if paid by the Employer, shall be recoverable from the Contractor. The sale of alcoholic drinks or other intoxicating drugs or beverages upon the work, in any labour camp, or in any of the buildings, encampments or tenements owned or occupied by, or within the control of, the Contractor or any of his employees directly or through subcontractors employed on the work, shall be forbidden, and the Contractor shall exercise his influence and authority to secure strict compliance with this condition. The Contractor shall also ensure that no labour or employees are permitted to work at the site in an intoxicated state or under the influence of drugs. The Contractor shall remove from his camp such labour and their families, as refuse protective inoculation and vaccination when called upon to do so by the Engineer on the advice of the Medical Authority. Should Cholera, Plague or any other infectious disease break out, the Contractor shall at his own cost burn the huts, bedding, clothes and other belongings of or used by the infected parties. The Contractor shall promptly erect new huts on healthy sites as required by the Employer, within the time specified by the Employer, failing which the work may be done by the Employer and the cost recovered from the Contractor.

4.13.4. **Labour Accommodation**

The Contractor shall provide living accommodation that is equal to or exceeds the minimum criteria established in the following sub-sections, needed to house his staff, workers employed directly or through sub-contractors. The buildings shall be constructed to have a minimum life of not less than the length of the Contract.

a. The roofs shall be watertight and laid with suitable non-flammable materials permissible for residential use under local regulations and for which the consent of the Engineer has been obtained.
b. Each hut shall have suitable ventilation. All doors, windows, and ventilators shall be provided with security leaves and fasteners. Back to back units may be avoided.
c. The minimum height of each unit shall be 2.10m and shall have separate cooking place.
d. Suitable no. of common toilet/bath shall be provided.

4.13.5. **Water Supply**

The Contractor shall provide an adequate supply of water for the use of labourers in the Camp. The provision shall not be less than two gallons of pure and wholesome water per head per day for drinking purposes and three gallons of clean water per head per day for bathing and washing purposes. Where piped water supply is available, supply shall be at stand posts and where the supply is from wells or river, tanks which be of metal or masonry shall be provided. The Contractor shall also at his expense plan for the provision and laying of water pipe lines from the existing mains wherever available and shall pay for all the fees and charges thereof.

4.13.6. **Drainage**

The Contractor shall provide efficient arrangements for draining away sewage water to keep the camp neat and tidy. Surface water shall be drained away from paths and roads and shall not be allowed to accumulate into ditches or ponds where mosquitoes can breed.

4.13.7. **Sanitation**

The Contractor shall arrange for conservancy and sanitation in the labour camps according to the rules and regulations of the Local Public Health and Medical Authorities. The Contractor shall provide a sewage system that is adequate for the number of residents in the camp, and which meets the requirements of the Municipality Authorities.

5. Section 5: Special Conditions of Contract (SCC)

SCC Clause	Reference to GCC Sub-Clause No.	Description
1	**Sub-Clause 3.2**	**Functions of Engineer** In addition to the duties mentioned in Clause 3.2 of General Conditions of Contract: (i) Shall watch and inspect the Works, monitor and examine any material to be used and workmanship employed by the Contractor in connection with the Works; (ii) Shall carry out such duties and exercise such powers vested in the Engineer in accordance with the provisions of the Contract; (iii) Shall issue instructions which in his opinion are necessary for the execution of the Works; and (iv) May issue any other instruction which in his opinion is desirable in connection with the Works. In case The Engineer is employee of any agency hired by the Employer, the Engineer shall take the approval of the Employer for all technical and financial matters otherwise he shall be deemed to have taken the approval of the Employer.
2	**Sub Clause 4.2.1**	**PERFOMANCE SECURITY** This Clause is deleted in SCC & GCC Clause is applicable.
3	**Sub-Clause 4.4**	**Coordination with other Contractors** The contractor shall plan and execute work in coordination and in co-operation with other contractors working for adjacent.
4	**Sub-clause 4.5**	**Sub-contractors** The **work should not be sublet**.
5	**Sub-Clause 4.10**	**Sufficiency of Tender** The Bidder shall be entirely responsible for sufficiency of rates quoted by him in his tender. The Contractor (Successful Bidder) shall be paid for only at quoted/accepted rates for the items of works executed as per BOQ.
6	**Sub-Clause 4.11**	**Access Route** All operations for the execution of the Works shall be carried out so as not to interfere unnecessarily with the convenience of the public or the access to public or private roads or footpaths or properties owned by the Employer or by any other person. The Contractor shall select routes, choose and use vehicles so that movement of Contractor's Equipment, Plant and Materials from and to the Site is limited so that traffic is not delayed and damage to highways and bridges is prevented. If there is any delay or damage or injury, the cost of rectification or reconstruction of highways or bridges shall be borne by the Contractor. The Contractor shall indemnify the Employer in respect of all claims, demands, proceedings, damages, costs, charges and expenses whatsoever arising out of or in relation to any such matters
8	**Sub-Clauses 4.16 and 6.7**	**Safety Precautions** The Contractor is required to make himself aware of all the requirements of the Employer's Safety, Health and Environmental Manual in this regard and comply with them. The Site Safety Plan shall include detailed policies, procedures and regulations which, when implemented, will ensure compliance

SCC Clause	Reference to GCC Sub-Clause No.	Description
		with Sub-Clauses 4.16 and 6.7 of General Conditions of Contract. The Contractor shall, from time to time and as necessary or required by the Engineer, produce supplements to the Site Safety Plan such that it is at all times a detailed, comprehensive and contemporaneous statement by the Contractor of his site safety and industrial health obligations, responsibilities, policies and procedures (under the laws of India) or as stated in the Contract or elsewhere relating to work on Site If at any time the Site Safety Plan is, in the opinion of the Engineer, insufficient or requires revision or modification to ensure the security of the Works and the safety of all workmen upon, and visitors to the Site, the Engineer may instruct the Contractor to revise the Site Safety Plan. The Contractor shall, within 14 days, submit the revised plan to the Engineer for review.
9	**Sub-Clause 4.17**	**Protection of the Environment** The Contractor shall maintain ecological balance by preventing deforestation, water pollution and defacing of natural landscape. The Contractor shall, so conduct his cleaning operations, as to prevent any avoidable destruction, scarring or defacing of natural surroundings in the vicinity of work. In respect of ecological balance, the Contractor shall observe the following instructions (a) Where destruction, scarring, damage or defacing may occur as a result of operations relating to construction and maintenance activities, the same shall be repaired, replanted or otherwise corrected at Contractor's expense. All work areas shall be smoothened and graded in a manner to confirm to natural appearance of the landscape as directed by the Engineer. (b) All trees and shrubbery, which are not specifically required to be cleared or removed for cleaning purposes, shall be preserved and shall be protected from any damage that may be caused by Contractor's cleaning operations and equipment. The removal of trees or shrubs will be permitted only after prior approval by the Engineer. Trees shall not be used for anchorage. The Contractor shall be responsible for injuries to trees and shrubs caused by his operations. The term "injury" shall include, without limitation, bruising, scarring, tearing and breaking of roots, trunks or branches. All injured trees and shrubs shall be restored as nearly as practicable, without delay, to their original condition at Contractor's expenses. (c) The Contractor shall provide all necessary access, assistance and facilities to enable the Engineer and the Employer to monitor and conduct tests to verify that the Site Environmental Plan is being properly and fully implemented
10	**Sub-Clause 4.18**	**Electricity and Water** Electricity and water shall be arranged by the contractor on his own and at his cost. If available, the Employer may provide Water supply and Electricity on chargeable basis. The contractor shall make his own arrangements to tap the Electricity from the nominated and existing sockets/ points. The contractor shall tap the Electricity as per IE Rules & IE Act (Latest) duly complying all safety precautions and under following conditions: (a) The contractor shall submit full scheme for the requirement of Electricity

SCC Clause	Reference to GCC Sub-Clause No.	Description
		& water. If scheme mentions Electricity requirement which is beyond the capacity of the Employer, in that case the contractor shall make his own arrangements/ alternative arrangements. (b) The Contractor should make his own arrangements to draw the water from the available water point to the working place without affecting the premises
11	**Sub-Clause 4.19**	**Employer Supplied Machinery and Materials** The ***Employer will not provide*** any machinery or materials under the Contract.
12	**Sub Clause 4.27**	**Security of the Site** The Contractor shall take all measures necessary to ensure such security, including exercising control over all persons and vehicles which are employed or engaged on the Site or in connection with the Works or the other works comprising the Project and with the security arrangements applicable to any other site within the Project. The Contractor shall arrange the issue of passes for the admission of all persons and vehicles to the Site or to any part thereof and may refuse admission to or remove from the Site any person or vehicle failing to show an appropriate pass on demand to any duly authorised person. If required by the Engineer, the Contractor shall submit a list identifying all persons to whom passes have been issued together with two photographs of each person and all entities to which a pass has been issued in respect of any vehicle and shall satisfy the Engineer of the bonafides of any such person or entity. The Contractor shall not, without the written permission of the Engineer or otherwise in accordance with the Contract, allow access to the Site to any person unless the presence on Site of such person is necessary in connection with the execution of the Works or with the discharge of the duties of any relevant authority. For the purposes of this Clause only, "Site" shall include off-Site places of manufacture or storage and the Contractor's Work Areas and shall include, areas provided to the Contractor by others.
13	**Sub-Clause 5.3**	**Submission of Documents** The Contractor shall submit scheme of work, drawings and documents, as required by the Contract, to the Engineer in accordance with any submittal schedule agreed with the Engineer. This submittal shall be made sufficiently before the Works are to be carried out to give the Engineer and the Employer reasonable time to examine the drawings or other documents, to prepare comments and for any changes to be accommodated by the Contractor. Where the consent of the Engineer is required, the Engineer shall notify the Contractor in writing of his decision either within such period as may expressly be stipulated in the Contract or otherwise within a reasonable time. The Operation and Maintenance Manuals and drawings submitted by the Contractor shall, if required, be updated by him during the Defects Liability Period and re-submitted for review by the Employer's Representative.
15	**Sub-Clause**	**Labour Laws**

SCC Clause	Reference to GCC Sub-Clause No.	Description
	6.4	The Contractor shall, if required by the Employer, deliver to the Engineer or to his office; a return in detail, in such form and at such intervals as the Employer may prescribe, showing the number of labours employed in different categories by the Contractor for the entire work. The contractor must ensure compliance of all the labour laws including obtaining labour licence and registration of workers with BOCW Board.
16	**Sub-Clause 6.6**	**Housing Facilities** The Contractor shall have to make his own arrangements for housing facilities for his staff.
17	**Sub-Clause 6.7**	**Health and Safety** Contractors are required to take care of his labour/site staff working at site if any mishappening occurred.
18	**Sub Clause 7.0**	**Quality Control** The Contractor shall appoint a suitably qualified and experienced person, not otherwise engaged in the performance of the Contract, to act as manager of the quality assurance system and shall provide such other personnel and resources as required to ensure effective operation of the quality assurance system. The said manager shall carry out audits of the application of the quality assurance system and ensure effective quality control and delivery of quality assurance. The Contractor shall provide all necessary access, assistance and facilities to enable the Engineer to carry out surveillance visits both on and off the Site to verify that the quality assurance system is being properly and fully implemented. No extra payment shall be made in this regard and the cost of the Work under this element shall be deemed to be included in the Contract Price.
19	**Sub Clause 10.1**	**Defect liability period** The Defect liability period (DLP) shall be **24 months** from the date of issue of the latest Taking over Certificate for the whole of the works. **Work by persons other than 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 authorise the carrying out of such remedial or other work by a person other than the Contractor. If the remedial or other work so authorised by the Engineer is work, which, in the Engineer's opinion, the Contractor was liable to do under the defect liability period 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.
20	**Sub-Clause 11.1** **Sub-Clause 11.1.1**	**Contract Price & Payment** **In respect of All-Inclusive Contract** The Contract Price, subject to any adjustment thereto in accordance with the contract conditions, shall be all inclusive (including all taxes, duties, royalties etc.)

SCC Clause	Reference to GCC Sub-Clause No.	Description
	Sub-Clause 11.1.4	**Change in Taxes Duty** (a) "Change in Taxes/Duties/Levies" means the occurrence or coming into force of the following, at any time after the date of submission of tender. (i) Any new tax which is imposed on Composite Works Contractors applicable on Metro Project. (ii) Change in the rate of GST on Composite Works Contractors applicable on Metro Project as Per GST Act. (b) The Contract Price shall be adjusted due to any of the above two conditions. Adjustment in contract price will be applicable up to the stipulated date of completion of work including the extended period of completion where such extension has been granted under sub clause 8.4.1 of GCC or it is specifically mentioned that extension is with adjustment for changes as stated above. (c) If the extension of contract period is on account of contractor's fault under Sub-clause 8.4.3 of GCC, no compensation shall be made towards upward revision towards "change in Taxes/Duty (taking place during the said extended contract period)" as mentioned at Sl. No. (a) (i) & (ii) above, during the original contract period or extended contract period shall be on employer's account. (d) Any other changes (except on account of clause (a) (i) & (ii) above) in existing taxes/new taxes on supply of materials/services/works etc. will not be considered and its impact shall be considered covered in the price variation clause provided in the Contract and in Contract where Price Variation clause s not provided, the impact on any other change (except on account of clause (a) (i) & (ii) above in existing taxes/new taxes on supply of materials/services/works etc. will be deemed to be included in the quoted contract price. (e) Also, the contract price 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 last date of submission of tender.
21	**Sub clause 11.1.3**	**Price Variation** This is a fixed price contract and no Price Variation is admissible in this contract.
22	**Sub-Clause 11.2**	**Advance** No Advance is admissible in this contract.
23	**Sub-Clause 11.6**	**Payment** **As per 4.11 clause** For the purpose of On-account payment, the contractor shall submit detailed activities carried out as per BOQ recorded in Measurement sheets, Abstract sheets along with recorded bill for the item actually executed for checking and payment. Payment will be affected based on unit rates as approved in the Bill of Quantities.
24	**Sub-Clause 15.0**	**Insurance** (a) All the contractor's employees drawing monthly wages up to ₹21,000/- or as applicable as per the enhanced limit, shall have to be covered

SCC Clause	Reference to GCC Sub-Clause No.	Description
		under ESI. The Contractor shall take insurance policy as specified in the Employee's Compensation Act only for those employees who are not covered by ESI. (b) The contractor shall insure against liability to third parties in the joint name of the Employer and the contractor for any loss, damage, death or injury which may occur to any physical property (except things insured otherwise) or any person (except person insured by employer, staff of other contractor working in the premises, contractor's staff under sub clause above which may arise out of the performance of the contract. ***The insurance shall be at least for the amount of INR 7.5 Lac for each incident.*** (c) Insurance cover for Contractor's All Risk shall be full value of Contract price.
25	**Sub-Clause 18.1**	**Notices and Instructions** The Contractor shall furnish to the Employer/Engineer the postal address of his office at Delhi NCR. Any notice or instructions to be given to the Contractor under the terms of the contract shall be deemed to have been served on him if it has been delivered to his authorized agent or representative at site or if it has been sent by registered post to the office, or to the address of the firm last furnished by the Contractor. The Contractor shall establish an office in the Delhi NCR in consultation with the in charge for planning, co-ordination and monitoring the progress of the Work and intimate the same in writing to in charge. In addition, the Contractor may set up field offices at convenient and approved locations for co-ordination and for monitoring the progress of fieldwork at his own cost.
	Additional	**GENERAL CONDITIONS OF CONTRACT** a. This contract will be governed by NMRC's General Conditions of Contract and Special Conditions of Contract. The later will have priority over the earlier one in case of any ambiguity in any of the clause. b. All conditions mentioned in the General Conditions of Contract (GCC) will be applicable in addition to above.

6. Section 6: Technical Specifications

6.1. Specifications

a. IS (Indian Standards) Codes and IE Rules/IEC standards and Specifications are applicable in this contract.

6.2. Specifications

Specifications for Civil Works

Puf Panel Insulated Roof

Fixing of Puff Panel Roofing shell be constructed of 60+30 mm thick PUF (Poly Urethane Foam) & density of 40 + 2 kg/m3 laminated with 0.5mm Pre-coated GI outside and 0.5mm inside of roof. Over the perlin over main trusss as / structure. The roofing panel shall have overlap joinery systems. The top coat of the panels shall preferably be AWT color & Bottom AWT. Complete in all respect.

Polycarbonate Sheet

Fixing of Polycarbonate sheet (4 mm thick) inserted in 50 mm Aluminium Extrusion standard tightened with EPDM RUBBER GASKET with SDS screws and fasteners over steel structure as / drawing complete in all respect. Transparent silicone 789 shall be used to fill the joints.

Terrace Garden

Laying of grass Selection No 1 over Growing Medium Soil (200 mm thick) over 0.8 to 0.9 mm thick Geotextile of GSM 140 (+-5%) of Quality Code ST-14 over Drainage Board 8 to 9 mm thick of GSM 400 (+-5%) Quality Code DB-04 over 1 mm APP membrane over RCC slab complete in all respect.

Specifications of Plumbing works

Section-I: Internal Rain Water Drainage

Scope of Work

The scope of work under this section comprises the supply, installation, testing and commissioning of internal drainage services. This shall consist of furnishing all labor, materials, equipment and appliances necessary and required to completely install rainwater pipes and fittings as required by the drawings, and given in the schedule of quantities.

Piping System

Rain water pipes in shafts, ducts and in concealed areas etc. shall consist of uPVC pipes confirming to IS to IS 4985 (class C) & fittings as called for.

The rain water pipes shall be circular with a minimum diameter of 150mm. Pipes shall be fixed by means of galvanized steel clamps in two sections, bolted together, built into the walls, wedged and neatly jointed as directed and approved by the Owner‘s site representative. All bends, branches, swan neck and other parts shall conform to the requirement and standards as described for the pipes. Pipes shall be rested against the walls on suitable wooden cradles. Local authority regulations applicable to the installations shall be strictly followed.

Access doors for fittings and clean outs shall be so located that they are easily accessible for repair and maintenance. Any access panel required in the civil structure, false ceiling or marble cladding etc. shall be clearly reported to the Owner in the form of shop drawings so that other agencies are instructed to provide the same.

Piping Materials

1. The pipes shall be round and shall be supplied in straight lengths with socketed ends. The

internal and external surfaces of pipes shall be smooth, clean, and free from grooving's and other defects. The ends shall be cleanly cut and square with the axis of the pipe. The pipes shall be designed by external diameter and shall conform to IS: 4985-1981. The pipes shall be of ClassIII; 6 kg/sqm pressure rating.

2. Fittings shall be of the same make as that of pipes, injection moulded and shall conform to Indian Standard

Supports

h. UPVC pipes require supports at close intervals. Recommended support spacing for unplasticised PVC pipes is 1400 mm for pipes 50 mm dia and above. Pipes shall be aligned properly before fixing them on the wooden plugs with clamps. Even if the wooden plugs are fixed using a plumb line, pipe shall also be checked for its alignment before clamping, piping shall be properly supported on, or suspended from clamps, hangers as specified and as required. The Contractor shall adequately design all the brackets, saddles, anchors, clamps and hangers and be responsible for their structural sufficiency. Pipe supports shall be primer coated with rust preventive paint.

i. Laying and Jointing

j. The pipes shall be laid and clamped to wooden plugs fixed above the surface of the wall. Alternatively plastic clamps of suitable designs shall be preferred. Provision shall be made for the effect of thermal movement by not gripping or disturbing the pipe at supports between the anchors for suspended pipes. The supports shall allow the repeated movements to take place without abrasion.

k. Jointing for UPVC pipes shall be made by means of solvent cement for horizontal lines and ‗O' rubber ring for vertical line. The type of joint shall be used as per site conditions / direction of the Owner's site representative. Where UPVC pipes are to be used for rain water pipes, the pipe shall be finished with GI adopter for insertion in the RCC slab for a water proof joint complete as directed by Owner's site representative.

l. All open terraces shall be drained by rain water down takes.

m. Rainwater down takes are separate and independent of the soil and waste system and will discharge into the underground storm water drainage system of the complex.

3. Rainwater in open area shall be collected in catch basins and connected to the Storm Water manhole.

Testing

1. Testing shall be done in accordance with IS: 1172 and IS: 5329 except as may be modified herein under.

2. Before use at site all uPVC pipes shall be tested by filling up with water for at least 30 minutes. After filling, pipes shall be struck with a hammer and inspected for blow holes and cracks. All defective pipes shall be rejected and removed from the site within 48 hours. Pipes with minor sweating may be accepted at the discretion of the Project Manager.

3. Entire drainage system shall be tested for water tightness and smoke tightness during and after completion of the installation. No portion of the system shall remain untested. Contractor must have adequate number of expandable rubber bellow plugs, manometers, smoke testing machines, pipe and fitting work tests. All materials obtained and used on site must have manufacturer's hydraulic test certificate for each batch of materials used on the site.

Section-II: External Drainage (Storm Water Disposal)

Scope of Work

The scope under this section comprises the supply, installation, testing and commissioning of external storm drainage services.

The drainage system shall include: Storm water drainage, earth works for excavation, disposal, backfilling and compaction, pipe lines, manholes, catch basins and connections to the existing municipal storm water drain.

All materials shall be new and of quality conforming to specifications and subject to the approval of the Owner‘s site representative.

Drainage lines and open drains shall be laid to the required gradients and profiles. All drainage work shall be done in accordance with the local municipal bye-laws.

Contractor shall obtain necessary approval and permission for the drainage system from the municipal or any other competent authority.

Location of all manholes, etc. shall be got confirmed by the Project Manager before the actual execution of work at site. As far as possible, no drains shall be laid in the middle of road unless otherwise specifically shown on the drawings or directed by the Project Manager in writing.

All materials shall be rust proofed; materials in direct or indirect contact shall be compatible to prevent electrolytic or chemical (bimetallic) corrosion.

Pipe and Drain Trench

Alignment

1. The storm water drainage pipes shall be carefully laid to levels and gradients shown in the plans and sections but subject to modifications as shall be approved by the Architects from time to time to meet the requirements of the works. Great care shall be taken to prevent sand etc. from entering the pipes. The pipes between two manholes shall be laid truly in straight lines without vertical or horizontal undulations. The body of the pipes shall rest on an even bed in the trench for its length and places shall be excavated to receive collar for the purpose of jointing. No deviations from the lines, depths of cuttings or gradients as called for on the drawings shall be permitted without the written approval of the Architect. All pipes shall be laid at least 45cms below the finished ground level or as called for on the drawings. Trenches Setting Out
2. The contractor shall set out all trenches including widths, manholes, chambers and such other works to true grades and alignments as called for. All trenches shall be laid to true grade and in straight lines and as shown on the drawings. Trench Excavation
3. The trenches for the pipes shall be excavated with bottoms formed to level and gradients as shown on the drawings. In soft and filled in ground, the Project Manager may require the trenches to be excavated to a greater depth than the shown on the drawings and to fill up such additional excavation with concrete (1:4:8) consolidated to bring the excavation to the required levels as shown on the drawings.
4. All excavations shall be properly protected where necessary by suitable timbering, piling and sheeting as approved by the Project Manager. All timbering and sheeting when withdrawn shall be done gradually to avoid falls. All cavities be adequately filled and consolidated. No blasting shall be allowed without prior approval in writing from the Architect. It shall be carried out under thorough and competent supervision, with the written permission of the appropriate authorities taking full precautions connected with the blasting operations. All excavated earth shall be kept

clear of the trenches to a distance equal to 75 cms. Trench Back Filling

5. Refilling of the trenches shall not be commenced until the length of pipes therein has been tested and approved. All timbering which may be withdrawn safely shall be removed as filling proceeds. Where the pipes are unprotected by concrete hunching, selected fine material shall be carefully hand-packed around the lower half of the pipes so as to buttress them to the sides of the trench. Width of trench
6. Recommended width of trenches at the bottom shall be as follows:-

100 mm dia pipe	55 cms
150 mm dia pipe	55 cms
225-250 cms dia pipe	60 cms

7. Maximum width of the bed concrete shall also be as above. Should the contractor excavate the trenches to width greater that specified above, no additional payment will be admissible for widths greater than specified. The contractor shall also fill the cement concrete for the pipe to the full width of the excavated trench with any extra cost.

Piping Material

RCC pipes

1. All pipes shall be centrifugally spun RCC pipes NP3. Pipes shall be true and straight with uniform bore throughout. Cracked, warped pipes shall not be used on the work. All pipes shall be tested by the manufacturer and the Contractor shall produce, prior to use on site, a certificate to that effect from the manufacturer. The pipes shall be with or without reinforcement as required and of the class as specified. These shall conform to IS: 458-1971.
2. All pipes shall be true to shape, straight, perfectly sound and free from cracks and flaws. The external and internal surface of the pipes shall be smooth and hard. The pipes shall be free from defects resulting from imperfect grading of the aggregate mixing or moulding. Pipe Laying
3. RCC spun pipes shall be laid on cement concrete bed of cradles as specified and shown on the detailed drawings. The cradles may be precast and sufficiently cured to prevent cracks and breakage in handling. The invert of the cradles shall be left 12 mm below the invert level of the pipe and properly placed on the soil to prevent any disturbance. The pipe shall then be placed on`the bed concrete or cradles and set for the line and gradient by means of sight rails and boning rods, etc. Cradles or concrete bed may be omitted, if directed by the Project Manager. Pipe Jointing
4. Semi flexible type collar joint. Hemp rope soaked in neat cement wash shall be passed round the joint and inserted in it by means of caulking tool. More skein of yarn shall be added and rammed home. Cement mortar with one part of cement and two part of sand and with minimum water content but on no account soft or sloppy, shall be carefully inserted, punched and caulked into the collar and more cement mortar added until the space of the collar has been filled completely with tightly caulked mortar. Provision of rubber sealing ring in the collar joint shall also be made. The joint shall then be finished off neatly outside the socket at an angle of 45 deg.
5. The joint shall be cured for at least seven days. Refilling at joints will be permitted only on satisfactory completion of curing period.
6. Cement Concrete for Pipe Supports:
    a. Pipes may be supported on brick masonry or precast RCC or in situ cradles. Cradles

shall be as shown on the drawings.

		up to 1.5 m depth	up to 3 m depth	beyond 3 m depth
1	RCC or SW in sub soil water	All round (1:3:6)	In Haunches (1:3:6)	In Haunches (1:3:6)

b. Unless otherwise directed by the Project Manager cement concrete for bed, all round or in haunches shall be as follows:

c. Pipes in loose soil or above ground shall be supported on brick or stone masonry pillars as shown on the drawings.

7. Measurement:

   a. Measurement for excavation of pipes trenches shall be made per linear meter.

   b. Trenches shall be measurement between outside walls of manholes at top and the depth shall be the average depth between the two ends to the nearest cm. The rate quoted shall be for a depth up to 1.5 metre or as identified in the Schedule of Quantities.

   c. RCC pipes shall be measured for length of the pipe line per linear meter. Length between manholes shall be recorded from inside of one manhole or inside of other manhole.

Construction of Manhole

1. Based on approved drawings, manholes are to be constructed, the excavation, filling back and ramming, disposal of surplus earth, preparation of bottom and sides etc. shall be carried out as described earlier under trench excavation.
2. The manhole shall be built on a base concrete 1:3:6 of 150mm thickness for manholes up to 1500mm depth and 250mm thickness for manholes from 1500 to 2500mm depth and 300mm thickness manholes of depth greater than 2500mm. Reinforcement as shown shall be provided in the base slabs.
3. The walls shall be of brick work of thickness as shown in drawings built in cement mortar 1:5. The joints of brick work shall be raked and plastered internally in cement mortar 1:3 and finish with a coat of neat cement, external plaster shall be rough plaster in 1:3, PCC benching & semicircular channels of the same diameter as the pipes shall be provided and finished with neat cement coating.
4. All manholes shall be provided with poly propylene coated steel reinforced foot rest. The polypropylene shall confirm to ASTM D-4101 specification, injection moulded around 12 mm dia IS-1786 grade FE-415 steel reinforcing bar. These rungs shall be set at 30cms interval in two vertical runs at 380mm apart horizontally. The top rung shall be 450mm below the manhole cover.

Measurements

5. Manhole shall be measured in numbers as indicated in the Bill of Quantity. The depth of manhole shall be measured from invert of channel to the top of manhole cover.
6. Manhole with depth greater than specified under the main item shall be paid for under `Extra Depth' and shall include all items as given for manholes depth will be measured to the nearest cm. Depth of the manholes shall be measured from top of the manhole cover to bottom of channel. The following shall be inclusive in the quoted para of manhole
7. Bed concrete Brick work.

a. Inside & Outside Plastering

b. R C C top slab, benching and channelling including drop connections.

c. Supply and fix foot rests.

d. De-watering of chambers

e. Excavation, refilling, necessary de-watering and disposing off surplus soil

f. Cost of angle frame and embedding the frame in concrete bed. Road Gully Chambers

8. The chamber shall be of brick masonry with Bricks of class designation 75 in cement mortar 1:5 (1cement : 5 coarse sand) and shall have a PCC/SFRC/D.I dully grating with frame fixed in 150mm thick cement concrete 1:2:4 (1cement : 2 coarse sand : 4 hard stone ballast 20mm nominal size) on top. The size of the chamber shall be taken as the clear internal dimension as specified in the schedule of quantities. The brick walls on the top of the bed concrete 1:4:8 (1cement: 4 coarse sand: 8 hard stone ballast 40mm and down gauge) of the chamber shall be plastered with 12mm thick cement plaster 1:3 (1cement: 3 coarse sand) internally and externally and finished with a floating coat of neat cement. The excavation shall be done true to dimension and level shown in the drawing.

Testing

1. All storm water lines shall be carefully tested for water tightness by means of water pressure maintained for not less than 30 minutes. Testing shall be carried out from manhole to manhole. All pipes shall be subject to a test pressure of 1.5 meter head of water. The test pressure will however, not exceed 6 meters head at any point. The pipes shall be plugged preferably with standard design plugs or with rubber plugs on both sides, the upper end shall, however, be connected to a pipe for filling with water and getting the required head poured at one time.
2. Sewer lines shall be tested for straightness by:
    a. The contractor shall give a smoke test to the drain and sewer at his own expense and charges, if directed by the Owner‘s site representative.
    b. A test register shall be maintained which shall be signed and dated by contractor and Owner‘s site representative.
    c. Means of a mirror at one end a lamp at the other end. If the pipe is straight the full circle of light will be seen otherwise obstructions or deviations will be apparent.
    d. Inserting a smooth ball 12 mm less than the internal diameter of the pipe. In the absence of obstructions such as yarn or mortar projecting at the joints the ball shall roll down the invert of the pipe and emerge at the lower end.

Specifications of Electrical and other works

Section - I Lt Distribution Boards

Scope

This section covers specification of Distribution Boards (DBs) suitable for operation on 415 V 3 Phase 4 wire 50 Hz supply feeding final lighting and power sub circuits.

Standards And Codes

Updated and current Indian Standard Specifications and Codes of Practice will apply to the equipment and the work covered by the scope of this contract. In addition the relevant clauses of the Indian Electricity Act 2003, Indian Electricity Rules 1956, National Building Code 1997, National Electric Code 1985, Code of Practice for Fire Safety of Building (general): General Principal and Fire Grading – IS 1641-1988 as amended up to date shall also apply. Wherever appropriate Indian Standards are not available, relevant British and/or IEC Standards shall be applicable.

- Miniature Circuit Breakers for AC circuits IS 8828 : 1996 & IEC 947
- Residual current operated Circuit Breakers IS 12640 : 1988
- Low voltage switchgear and control gear Part II IS 13947 : 1993
- Degrees of Protection provided by enclosures for low voltage switchgear IS 2147 : 1962
- Code of Practice for installation and maintenance of switchgear not exceeding 1000 volts IS 10118 : 1982
- General requirements for switchgear and control gear for voltages not exceeding 1000 volts IS 4237 : 1982
- Specification for Low-voltages switchgear & control gear assembly (Part-1,2 & 3) IS 8623 : 1993

Miniature Circuit Breakers

The MCB's shall be of the completely moulded design suitable for operation at 240/415 Volts 50 Hz system. The MCB's shall have a rupturing capacity of 10 KA Ics. The MCB's shall have inverse time delayed thermal overload and instantaneous magnetic short circuit protection. The MCB time current characteristic shall coordinate with PVC cable characteristic. Watt loss per pole of MCB shall confirm to value specified in IS 8828 – 1996. Type test certificates from independent authorities shall be submitted with the tender or before approval.

Residual Current Circuit Breakers (RCCB)

RCCBs shall comply with IS 12640 – 1988 and shall be of the current operated type. The RCCB shall be designed to trip within 20 mili sec at a current sensitivity of 30 mA. The RCCB shall be of 2 pole construction for single phase and 4 pole construction for 3 phase. All RCCB shall be complete with test buttons. RCCB shall have a minimum life expectancy of 10,000 operations.

Distribution Boards

1. DBs shall be wall mounting, recessed/surfaced type, totally enclosed,16 SWG, dust and vermin proof and shall comprise of miniature isolator, miniature circuit breakers, earth leakage circuit breakers, busbars, neutral link etc. as required, of ratings detailed in the schedule of quantities.
2. DBs shall be double door type. Access to the wiring shall be possible without removing the outer hinged door. The door shall be earthed with insulated copper braded flexible wires.
3. Components forming a part of the DBs shall comply with the relevant Standards and Codes of the Bureau of Indian Standards.
4. As a general practice only prewired MCB type DBs shall be used, on account of their superior technical features, compared to conventional DBs, which don‘t allow for proper wiring space and wiring terminations. Rewirable fuse type DBs shall not be used.

5. Prewired DBs shall have following features :
    a. Recess / surface type with integral loose wire box
    b. Phase / neutral / earth terminal blocks for termination of incoming and outgoing wires.
    c. Din channel for mounting MCBs
    d. Arrangement for mounting incomer MCB/RCCB/RCBO/MCCB as required. e. Copper bus bar
    f. Earthing terminals
    g. Wiring from MCB's to phase terminal block
    h. Interconnection between terminal block/incoming switch / bus bar/neutral terminal block / earth terminal connector with specified size of FRLS pre-insulated copper conductor cable duly fitted with copper lugs / thimbles
    i. Terminal blocks should be suitable for termination of conductor / cable of required size but minimum rated cross section of the terminal blocks should be 6 sq mm
    j. Terminal block shall be made of flame retardant polymide material
    k. Colored terminal blocks and FRLS wires for easy identification of RYB phases, neutral and earth
    l. Prewired DB shall be provided with a detachable cassette for safe removal of MCBs, RCCBs. Terminal connectors from the DB without loosening the internal cable connections of phase and neutral circuits (This is an optional feature).
    m. The prewired DB shall have peel able poly layer on the cover for protection from cement, plaster, paints etc. during the construction period.
    n. Detachable plate with Knock out holes shall be provided at the top/bottom of board. Complete board shall be factory fabricated and prewired in factory ready for installation at site. The box and cover shall be fabricated from 1.6 mm sheet steel, properly pretreated, phosphatized with powder coated finish.

Where specified it shall be out double door construction provided with hinged cover in the front.

Name Plates and Labels

Suitable engraved white on black name plates and identification labels of metal for all Switchboards and Circuits shall be provided. These shall indicate the feeder number and feeder designation.

Section - II Cable Tray/Raceway

Cable Trays

1. **Ladder type Cable tray** – for Power Cables only
    a. Cable trays shall be ladder type fabricated out of mild steel/slotted angles and flats of

required width as per design.

b. Bends shall be prefabricated. The cable tray shall be hot dip galvanized or primed and painted with powder coating as asked for in BoQ or as approved by Owner/Consultant.

c. The minimum weight of the zinc coating shall be 460 gm/sq.m and minimum thickness of coating shall not be less than 75 microns.

2. **Perforated Cable tray** – for Cables for Low current service only

a. The perforated cable trays are fabricated out of 2.0 mm thick CRCA sheet steel having minimum 50mm depth or as called for in BOQ, hot dip galvanized or epoxy coated of approved shade.

b. Perforations are maximum 10mm spaced at maximum 20mm distance. The cables shall be tied with the cable tray with nylon strip/aluminium clamps/M.S. clamps as per requirements.

c. Suitable provision shall be made where a tray crosses expansion joints. The width of the tray shall allow for a suitable separation between cables the design shall allow for adequate bending radius for the sizes of cables.

d. No sharp bend to be allowed in cable tray. Joints between sections shall be bolted.

e. The tray shall be suspended from the surface of the concrete slab by means of approved steel hangers spaced at a distance of not more than 125cms. Suitable bushes shall be provided where cables pass through apertures in the tray.

f. Cables must be securely fixed to the tray with clamps or cable ties. In routing necessary barrier and spacing shall be maintained for cables of different voltages in case they lie side by side.

g. Telephone cables shall cross the power cables only at about right angle and these two shall not run in close proximity.

h. Full details of the tray shall be approved by the Consultant/Site Engineer before fabrication. Earth continuity shall be maintained between each section of cable tray and each total run of tray shall be effectively bonded to the nearest earth continuity 0 conductor.

i. All nuts and bolts used shall be of galvanised steel.

j. Depending on the size of cable trays space of 20-33% has to be maintained for future expansion.

k. Cable tray is manufactured to comply with the specifications of National Electrical Code (NEC) and National Electrical Manufacturer‘s Association (NEMA).

Hot Dip Galvanizing Process for Mild Steel Used for Earthing, Cable Trays or Junction Boxes for Electrical Installation.

GENERAL REQUIREMENTS

1. Quality of Zinc: Zinc to be used shall conform to minimum Zn 98 grade as per requirement of IS: 209-1992.

2. Coating Requirement

a. Minimum weight of zinc coating for mild steel flats with thickness up to 6 mm in accordance with IS:6745-1972 shall be 400 g/sqm.

b. The weight of coating expressed in grams per square metre shall be calculated by dividing the total weight of Zinc by total area (both sides) of the coated surface.

c. The Zinc coating shall be uniform, smooth and free from imperfections as flux, ash and dross inclusions, bare patches black spots, pimples, lumpiness, runs, rust stains bulky white deposits, blisters.

d. Mild steel flats / wires shall undergo a process of degreasing pickling in acid, cold rinsing and then galvanizing.

Fire Retardant Cable Paint & Fire Barrier:

1. The fire retardant paint / barrier shall be listed by independent test agencies such as UL, FM or OPL and be tested to, and pass the criteria of ASTM E 814 (UL1479) standard test method for fire test through- penetration fire stops and ASTM E 1996 (UL 2079) standard test method for fire resistive joint system/

Fire retardant cable Paint

a. The Fire resistant cable coating / painting shall be intumescent / ablative, water based compound, and the coating shall expand up to 10 times, supplied in a manufacturer seal container indicating manufacturing and expiry dates. The coating material shall be nontoxic, asbestos free, & halogen free and shall have good mechanical strength. The colour of paint shall be white and density of coating shall be 1.3kg/ltr, coating shall have a snap time of 30 minutes, the expansion shall begin at 230 deg.C and it shall have an oxygen index of 41%.

b. Coating shall be applied by ordinary paint brush after cleaning the cables of dust and oil deposition. A minimum textured finish of 3 mm wet film thickness shall be achieved by applying the material in 2-3 layers leaving intervals of 2 to 8 hours depending upon the moisture and thickness, moisture and temperature hours between each coat.

Fire Barrier sheet for floor and wall sealing

c. The framing & fixing part of fire barrier sheet shall be very simple & directly fixed around walls & floors by help of anchored bolts & washer. For 2 hour fire rating the fire barrier sheet shall be minimum 7.62 mm thick and shall be cut as per the profile of penetration and opening. The small gap left around the penetration shall be closed with fire rated soft & mouldable putty. Fire barrier must be design on the intumescent technology to seal larger penetration through the fire rated walls & floors. Fire barrier must be a composite construction with the quality incorporated with organic/ inorganic fire resistive elastomeric sheet with specific gravity of 1.6 gm/ cubic centimeter.

Testing of Cables

1. Cables shall be tested at works for the following tests before being dispatched to site by the project team.
    a. Insulation Resistance Test.
    b. Continuity resistance test.
    c. Sheathing continuity test.
    d. Earth test.(in armoured cables)
    e. Hi Pot Test.
2. Test shall also be conducted at site for insulation between phases and between phase and earth for each length of cable, before and after jointing. On completion of cable laying work, the

following tests shall be conducted in the presence of the Owner's site representative.

a. Insulation Resistance Test(Sectional and overall)

b. Continuity resistance test.

c. Sheathing continuity test.

d. Earth test.

3. All tests shall be carried out in accordance with relevant Standard Code of Practice and Electricity Rules. The Contractor shall provide necessary instruments, equipment and labour for conducting the above tests and shall bear all expenses in connection with such tests. All tests shall be carried out in the presence of the Owner's site representative.

Floor Cable Trunking

1. General

a. Trunking and fittings shall comply with BS 2989 or Indian Standard of IS277 with a GI coating thickness of 275GSM.

b. Trunking shall be top accessed. Inverted trunking is not acceptable.

c. All multi-compartment trunking systems shall maintain the stated segregation throughout, including all accessories.

d. Trunking shall be manufactured using pregalvanised sheet steel. Trunking shall be spot welded & arc welded throughout its length for better impact resistant and to prevent concrete seepage during installation. The trunking shall normally be supplied in 2500mm lengths with a material thickness of 1.6mm. Lengths of trunking, shall be coupled together by means of joint sleeves, made of pre galvanized GI with 275 GSM GI coating. At each joint in the trunking, continuity shall be maintained by means of copper links, not less than 25 x 3 mm to achieve an acceptable earth loop impedance level in compliance with BS 2989, fixed with brass nuts, bolts and serrated washers. Removal of any lid no matter how it is fitted shall not affect the earth continuity of the trunking. LSZH copper cable link with cable lugs may be used, if the proper connection method is provided to avoid long term corrosion and electrolytic action. The LSZH cable shall have an equivalent cross sectional area to the copper links. Bonding link shall be fixed on external surfaces.

e. Manufacturer's standard fittings shall be used for all connections and changes of direction. All vertical bends, Crossover boxes, access outlets, and junction boxes shall be of the same manufacturer as the trunking. Trunking shall not be cut or bent to form bends, flanges or attachments. Gusset bends shall be used wherever necessary to provide sufficient bending radius for the cables. Site fabricated items shall not be accepted.

2. The minimum size shall be 50mm by 40mm with single compartment. The maximum recommended size for the trunking is up to 300mm by 40mm with triple compartments.

3. All inside edges of trunking shall be smooth and provision shall be made to prevent abrasion at bends.

4. Cable retaining straps supplied by the trunking manufacturer shall be fitted at intervals not exceeding 1m. Where trunking passes through walls, floors and ceilings, proprietary fire barriers shall be installed in the trunking. The fire barrier shall have a rating not less than that of the original construction of the opening.

5. Trunking shall be adequately supported throughout its length. Trunking support and channel shall be quick-fixing type and shall be such as to space the trunking a minimum of 13mm from any part of the wall or bulkhead.
6. A minimum of two fixings shall be provided between joints in the trunking except where the distance between is less than the maximum spacing.
7. Where trunking is cut or drilled, the cut edges of the trunking shall be smoothed to prevent abrasion of the cables and shall be painted with anti-corrosion paint like aluminium coating, to the same colour as the adjacent surfaces, such painting to be carried out as the work proceeds. In no circumstances will rough screw edges and nuts be allowed in the interior of the trunking.
8. Flush or buried trunking and under floor metal ducts shall comply with BS 2989.
9. The space factor for cables installed in trunking shall not exceed 35% as per IEE regulations.
10. All lengths of vertical run trunking in excess of 3000mm shall contain cable supports made of insulating, non-hygroscopic, non-combustible material. The spacing between such supports shall not exceed 1800mm.
11. An additional support shall be provided at the top of all vertical runs exceeding 3000mm, to support the weight of the cable and distribute the cables within the trunking to prevent undue compression of the installation.
12. Where trunking crosses expansion joints, a trunking fitting shall be used which shall allow for expansion and maintain earth continuity.
13. Suitable cutout on underfloor trunking at ticket barriers shall be provided to suit Automatic Fare Collection System Contractor‘s requirement. The cutout shall not have a sharp edge or abrasive effect on cables. The location and route for the cutout and under floor trunking shall be according to Working Drawings.
14. Trunking installed externally shall be manufactured from galvanized sheet steel in accordance with BS 2989 protection Class 3, or other international standards. Trunking installed internally shall be of Class 2.
15. Partitions or dividers shall be of the same material and finish as the trunking. The method of fixing shall not cause any long-term corrosion or electrolytic action.
16. Connections to multiple boxes, switchgear and distribution boards shall be made with multi compartment vertical access boxes. Expansion joints in long continuous runs shall be provided as recommended by the manufacturer.

Access Outlets

1. Access Outlets are made of very high quality materials to withstand heavy load and corrosion.
2. Manufactured from high-pressure die cast material for strength &durability.
1. The trap frame & trap are made of flame retardant Engineering Plastic - ABS & Polyamide ratchet for strength & durability.
2. The Trap Frame can be easily removed by pulling either one of the Nylon Bars to detach & remove the unit for servicing or installation of accessories to save installation & servicing time.
3. Patented screw less ratchet bar level adjusting system to match with screed / floor height. The trap lid is self-adjustable to any floor finish thickness.
4. Trap cover must be reinforced with a 2.5mm thick pre-galvanized steel plate to provide rigidity & added strength. Trap lid to have a screw less knob-hinged design for quick mounting on to the

frame requiring minimum maintenance.

5. The Trap cover must have 8 mm recessed for installation of carpet and tiles.
6. Trap trim design to protect carpet from damages and give the floor area added aesthetics.
7. Trap lid should be made of Electrostatic Polyester Epoxy Coating to provide excellent and enhanced protection on visible parts against chemical or saline corrosion.
8. Strong and durable trap lifting handle on the trap cover is made of similar color material and has special design for easy lifting, even with large fingers.
9. Cables are guided by Cable Retainers through generous cable outlet which open automatically and lock into position when cables are present.
10. Trap cover of Access box should be retained by Cable Grommets with high quality durable foam to prevent the cable damage from exit position & also prevent ingress of dust when closed.
11. Access Outlet should carry service plates for providing services i.e.: Power, Data & Telecom. The Access outlets must accommodate to have three compartments to run Mains Voltage & Extra Low Voltage cables.
12. The system must have Positive Double Earthing connections.
13. Earth wire connector should be provided in all the boxes, and complies with the requirement of current IEE regulation.
14. Access outlets are tested to a load bearing of 2 tons on the trap lid for heavy traffic areas
15. Four side blanks are made with removable perforations to suit ducts installation.
16. Standards & Approvals – The system must comply with the relevant specification & IEC 61084 standards.

Crossovers/Junction Boxes

1. Cross Overs/Junction boxes are made of very high quality materials to withstand heavy load and corrosion.
2. Manufactured from high-pressure die cast material for strength &durability.
3. The trap lid is self-adjustable to any floor finish thickness using the levelling screws on all the four corners.
4. The Trap cover is made of 2.5mm thick pre-galvanized steel plate to provide rigidity & added strength.
5. The Trap covers to have flexibility for quick mounting on to the base box requiring minimum maintenance.
6. The Trap cover must have 8mm recessed for installation of carpet and tiles.
1. The Flyover units, trap frame and traps should be made of Electrostatic Polyester Epoxy Coating to provide excellent and enhanced protection on visible parts against chemical or saline corrosion.
2. The Cross Overs should carry fly-over made of Electrostatic Polyester Epoxy Coating for cables passage to ensure segregation of service
3. Crossovers are tested to a load bearing of 3.6 tons on the trap lid for heavy traffic areas. The Cross Overs should have provision to Power, Data & Telecom services.
4. The system must accommodate to run Mains Voltage & Extra Low Voltage cables.

5. The trap cover screws must be made from Stainless Steel for extra protection.
6. The system must have Positive Double Earthing connections.
7. Earth wire connector should be provided in all the boxes, and complies with the requirement of current IEE regulation.
8. The complete system must have excellent protection against rust.
9. Four side blanks are made with removable perforations to suit ducts installation of up to 38-mm height.
10. The one-piece base frame design ensures minimum openings to prevent concrete seepage into the box during casting of concrete or screeding.
11. Standards & Approvals – The system must comply with the relevant specification & IEC 61084 standards.

Vertical Access Boxes

1. Vertical access boxes are made of very high quality materials to withstand heavy load and corrosion.
2. Vertical access boxes facilitate the connectivity of floor raceways to the equipment on the wall like the distribution boards, so the product should be designed as —L‖ shaped
3. The Vertical access boxes should have provision to carry Power, Data & Telecom services
4. The vertical access boxes should have the duct entry knockouts of up to 38mm and also provision for carrying the conduits to the wall
5. The vertical access boxes are made of electrostatic polyester epoxy coating to prevent the rust accumulation.

Section III- Light Fixtures

Light Fittings

Technical parameters to be followed by all light fixtures unless specified in:

1. Efficacy of the fixture must be minimum 95 lumen/Watt,
2. Service Life of the fixture should be minimum 50,000 burning hours,
3. The LED used should be of following makes- Nichia/Cree/Philips-Lumiled/Osram/Sharp/Seoul.
1. The CRI of the fixture should be minimum 80 for indoor applications and 70 for outdoor applications,
2. The THD should be less than 10%.
3. The housing of the indoor fixtures should be extruded aluminum/standard alloy housing,
4. For outdoor fixtures the housing shall be of high pressure die cast aluminium housing,
5. The IP category should be IP20 or higher for indoor applications and IP65 or higher for outdoor applications,
6. The Surge Protection to be provided conforming to relevant IS standards/IEC 61643-II Class-2 & EN 61643-II Type-2,
7. The manufacturers name/logo should be engraved/embossed on the housing/body or Name/Logo on aluminium plate labels or Name/logo printed on housing/body,

8. The warranty period on complete luminaire including driver/control gear, LED, all accessories should be 5 years from the actual date of completion of work.
9. The Power factor should be 0.95 or higher,
10. The total power consumption of the fitting should not be more than 110% of rated capacity of LED light.

Lighting Fixtures & Accessories

The light fixtures and fittings shall be assembled and installed in position complete and ready for service, in accordance with details, drawings, manufacturer's instructions and to the satisfaction of the Engineerin-Charge.

1. **Scope:** Scope of work under this section shall include inspection at suppliers/ manufacturer's premises at site up to satisfaction of Engineer-in-Charge or authorized representative. Light fixture can only be supplied after getting approval from Engineer-in Charge. Supplying at site, receiving at site, safe storage, transportation from point of storage to point of erection, erection and commissioning of light fittings, fixtures and accessories including all necessary supports, brackets, down rods and painting etc. as required as per .
2. **Standards:** The lighting and their associated accessories such as reflectors, housings, drivers etc., shall comply with the latest applicable standards, more specifically the following:

Light Fittings-General Requirements:

3. Fittings shall be designed for continuous trouble free operation under atmospheric conditions without reduction in lamp life or without deterioration of materials and internal wiring. Degree of protection of enclosure shall be IP-65 or above and as per for outdoor fittings.
4. Fittings shall be so designed as to facilitate easy maintenance including cleaning, replacement of drivers.
5. Outdoor type fittings shall be provided with weather proof junction boxes (IP-55) and IP-54 Control gear boxes. All Medium bay and high bay fixtures shall be supplied with junction box as per site requirement and as per.
6. Each fitting shall have a terminal block suitable for loop-out connection by 1100 V PVC insulated copper conductor wires up to 4 sq.mm. The internal wiring should be completed by the manufacturer by means of standard copper wire and terminated on the terminal block.
7. All hardware used in the fitting shall be suitably plated or anodized and passivated.
8. Earthing: Each lighting fitting shall be provided with an earthing terminal. All metal or metal enclosed parts of the housing shall be bonded and connected to the earthing terminal so as to ensure satisfactory earthing continuity throughout the fixture.
9. Painting/Finish: All surfaces of the fittings shall be thoroughly cleaned and degreased and the fittings shall be free from scale, rust, sharp-edges, and burns.
10. The housing shall be powder coated as required and as per. The surface shall be scratch resistant.
11. Luminaire shall have dual optics with primary optics distribution of 120 degree or higher and secondary optics as per site/ requirement.
12. Luminaire shall be designed to operate continuously for minimum 12 hours without deviation in the output parameters.

13. All the luminaires shall have LM-79, LM-80 and certificates from NABL accredited lab.
14. Luminaires and driver both shall be BIS certified individually.
15. Metal used in BODY of lighting fixtures shall be not less than 22 SWG or heavier if so required to comply with specification of standards. Sheet steel reflectors shall have a thickness of not less than 20 SWG. The metal parts of the fixtures shall be completely free from burns and tool marks. Solder shall not be used as mechanical fastening device on any part of the fixture.
16. Luminaire should be covered with suitable Glass or diffuser with High Transitivity. Outdoor luminaire shall be with clear toughened glass or clear polycarbonate cover.
17. Heat sink used should be extruded Aluminium or Pressure Die-Cast Aluminium having high conductivity preferably ADC 12 or LM 6.
18. Lighting fixtures and accessories shall be designed for continuous trouble free operation of minimum of 12 hrs under diverse atmospheric conditions without deterioration of materials.
19. Gasket: An extruded silicon loop gasket shall be provided in the lantern body to ensure a weather proof seal between the cover and the metal housing to exclude the entry of dust, water, insects, etc. Luminaire should conform to degree of protection of IP 65 or above. Felt gasket will not be accepted. This point is applicable only for highbays and outdoor type lumianires.
20. The fixture shall be suitable to work under following ambient conditions. Maximum ambient air temperature of 45 deg C (For Indoor products) Maximum ambient air temperature of 35 deg C (For Outdoor products).
21. For outdoor type luminaire it shall consist of separate optical and control gear compartment. Driver should be easily replaceable in the field conditions. Driver shall be integrated inside the luminaire and should not be kept behind light engine.
22. The Luminaire should be compliant to the following standards:
    - IEC 60529 - Classification of degree of protections provided by enclosures
    - 16103(Part 1) : 2012 Led Modules for General Lighting- Safety Requirements
    - 16103(Part 2) : 2012 Led Modules For General Lighting Part 2 Performance Requirements
    - IS 16107 (Part 1) : 2012 Luminaires Performance Part 1 General Requirements
    - IS 16107 (Part 2) : 2012 Luminaires Performance Part 2 Particular Requirements Section 1 LED Luminaire
    - IS 16104 : 2012 - d.c. or a.c. Supplied Electronic Control Gear for LED Modules - Performance Requirements
    - IS 16105 : 2012 Method of Measurement of Lumen Maintenance of Solid - State Light LED Sources
    - IS 16106 : 2012 - Method of Electrical and Photometric Measurements of Solid-State Lighting (Led) Products
    - IES LM-79-08 - Electrical and Photometric Measurements for Solid State Lighting Products
    - IES LM-80-08 - Measuring Lumen Maintenance of LED Light Sources

- IEC 60598-1 - General requirement and tests
- IEC 60068-2-38 - Specification for Permitted Humidity Test

- Immunity to interference EN 61547
- Safety EN 60928 / IEC 928 / IS 13021 (Part I)
- Performance EN 60929 / IEC 929 / IS 13021 (Part II)
- Vibrations & Bump tests IEC 68-2-6 FC / IEC 9001
- Quality Standard ISO 9001

- Environmental Standard ISO 14001
- DC Operation EN 60924
- Emergency Lighting Operation VDE 0108

Electronic driver

Driver shall comply with the following:

- EN 6 1000-3-2 – Harmonics
- EMI – Confirming to CISPR-15
- No Stroboscopic Effect
- Constant Wattage / Light output between 240 V ± 10%.
- Circuit protection for surge current and inrush current.
- Short circuits, open lamp protection
- RFI < 30 MHz EN 55015
- RFI > 30 MHz EN 55022
- Total Harmonic Distortion (THD)≦ 10%
- Output voltage ripple should be within 3%
- Full Load Efficiency of the driver ≥ 90%
- Current waveform should meet EN 61000-3-2

Installation

1. Fixtures shall be installed at mounting heights as detailed on the Drawings or as instructed on site by the Engineer.
2. Pendent fixtures within the same room or area, shall be installed plumb and at a uniform height from the finished floor. Adjustment of height shall be made during installation. Flush mounted recessed fixtures, shall be installed so as to completely eliminate leakage of light within the fixture and between the fixture and adjacent finish.
3. Fixtures mounted outlet boxes shall be rigidly secured to a fixture stud in the outlet box. Hickeys or extension pieces shall be installed where required to facilitate proper installation.
4. Fixtures located on the exterior of the building shall be installed with non-ferrous metal screws finished to match the fixtures.

5. All light fittings shall be supported with appropriate fixing accessories such as clips, supporting brackets, suspension sets, nuts, washers, screws etc. for their proper installation on different types of ceiling panels. Suspension sets shall be of adjustable type suitable to carry the weight of the lighting fittings unless otherwise stated or indicated on drawings.

6. electrodes shall not be less than 3 mm and of GI electrodes not less than 6 mm.
7. Pipe Earth Electrode: Pipe electrode shall be fabricated from a 40 mm dia 4500 mm long class B (medium) GI pipe. The GI pipe shall be tapered at the bottom and shall be provided with 12 mm dia holes drilled at every 75 mm.
8. Galvanizing: Galvanizing of Earth Electrodes and Earthing Conductors shall conform to class – IV of IS 4736: 1986.

Earth Pit

1. For plate electrodes: Plate electrode shall be buried in ground with its face vertical and top not less than 500 mm below ground level. The depth shall be increased if required so that permanently moist soil level is reached. The electrode shall be surrounded by alternate layers of charcoal and salt. A 20 mm dia class B GI pipe shall be provided for watering of the soil surrounding the electrode. The watering pipe shall have a watering funnel attachment with a wire mesh which shall be housed in the masonry inspection chamber. Main earth lead shall be securely terminated at the electrode by means of 2 bolts, nuts, checknuts and spring washers. The earth lead from the electrode up to the test link in masonry chamber shall be drawn in a suitable diameter class B GI pipe for mechanical protection. The GI pipe shall be provided with a coat of bituminous paint or bituminized jute wrapping for additional corrosion protection. The lead shall terminate in a test link provided in the inspection chamber to enable the earth electrode to be isolated for measuring earth resistance.
2. For pipe electrodes: Pipe electrode shall be installed with its stop not less than 200 mm below ground level. The top shall be provided with a 40 mm x 20 mm reducer to fix watering funnel with mesh on top. The entire length of pipe below the inspection chamber shall be surrounded by alternate layers of charcoal and sand. Earth lead shall be provided as for plate electrode and shall be terminated using a though bolt, nuts, check nuts, spring washers etc.
3. Masonry inspection chamber: The watering funnel arrangement as also earth test links shall be accessible and shall be housed in a 400 mm x 400 mm x 400 mm deep masonry inspection chamber having a lockable 10 mm thick cast iron hinged cover plate attached to a galvanized steel frame work embedded in the chamber walls. The hinged cover shall be suitably marked on top so that it is conspicuously identifiable as an earth station.
4. Location of earth electrodes: Location of earth electrodes shall be based on following guidelines.
    a. Minimum distance between any electrode and building structure shall be 1.5 m.
    b. Minimum distance between two adjacent electrodes shall be 2 m.
    c. Electrodes shall be located in accessible locations. Entrances, pavements and roads shall not be used for locating earth electrodes.

Earthing Conductor Main Earth

Lead

1. Interconnections between earth bus provided on the main switchboard inside the building for body earthing / neutral terminals of transformers / generators for neutral earthing and test link provided in the earth electrode inspection chamber shall be laid at minimum 300 mm depth below

ground (minimum 600 mm below road crossings and paved pavements).

2. For small installations where this lead is by means of GI / copper wire, the earth lead shall be drawn in a 15 mm dia class B GI pipe. For larger installations the GI pipe size shall be suitable for drawing the earth strip. GI pipe shall be provided with a coat of bituminous paint on the outside for minimizing corrosion. In locations where GI pipe protection cannot be provided, the earth conductor shall be wrapped with bituminous jute wrapping. Earthing conductors
3. Earthing conductors shall be connected to form the earthing network throughout the installation for earthing of all non-carrying metal parts as below. Materials and sizes shall be as per schedule of quantities
    a. Main earthing conductors shall be taken from the earth connections at the main switchboards to all other switchboards in the network.
    b. Sub-mains earthing conductors shall run from the main switchboard to the sub distribution boards and to the final distribution boards.
    c. Loop earthing conductors shall run from the distribution boards and shall be connected to any point on the main/sub-main earthing conductor, or its distribution board or to an earth leakage circuit breaker.
    d. Conduiting systems and cable armouring shall be earthed at the ends adjacent to switchboards at which they originate, or otherwise at the commencement of the run by separate loop earthing conductors in effective electrical contact with cable armour, switch boxes, accessories, lighting fitting etc.

Installation and Jointing of earthing conductors

4. Earthing conductors shall be provided in longest possible unbroken length to minimize jointing of the conductors in between terminations.
5. Strip conductors shall be secured to the building walls etc. with appropriate size of saddles at intervals not exceeding 900 mm. The saddle shall be gun metal for copper and GI for GI strips.
6. Copper earth strips shall be joined by butt welding /brazing or the mating surfaces shall be tinned, riveted and soldered.
7. GI earth strips shall be joined by GI bolts, nuts, checknuts and spring washers of appropriate size.
8. All exposed joints shall be provided with 2 coats of anti-corrosive paint.
9. Wires shall be joined by means of lugs of appropriate size connected by bolts, nuts, checknuts and washers. If the connection is on a painted surface, the paint shall be thoroughly removed and the metal exposed for making effective electrical contact. Lugs and bolts shall be of brass for copper wires and for GI wires.

Prohibited Connections

Neutral conductor, sprinkler pipes, or pipes conveying gas, water, or inflammable liquid, structural steel work, metallic enclosures, metallic conduits and lighting protection system conductors shall not be used as a means of earthing an installation or even as a link in an earthing system.

Resistance To Earth

1. No earth electrode shall have a greater ohmic resistance than 3 ohms as measured by an approved earth testing apparatus. In rocky soil the resistance may be up to 5 ohms.
2. The electrical resistance measured between earth connection at the main switchboard and any

other point on the completed installation shall be low enough to permit the passage of current necessary to operate circuit breakers, and shall not exceed 1 ohm.

Maintenance Free Earthing Electrode System/ Chemical Earthing

1. In maintenance free earthing copper bonded earthing rod electrode shall be of minimum 14.35 mm in diameter and 3 meter length. The rod shall be placed in a 150 mm dia an augured hole in the ground and then surrounded by ground enhancement material in either a dry form or pre mixed in a slurry. Once set, ground enhancement material becomes hard and as such holds positively to the rod as well as surrounding ground. Earth rod offered shall have passed the test required of BS7430/ ANSI/ UL467 and confirm to the adhesion of the copper coating to the steel core (Design feature that prevents the ingress of moister and subsequently the integrity of the rod.
2. Minimum 0.25 mm thickness of copper shall be deposited over the steel core as per BS 7430/ UL 467. Average life of the ground rod shall be 30 years in most soil.
3. Ground enhancement material shall be as per IEEE-80 clause 14.5d with a resistivity of less than 0.12 ohm-meter. The ground enhancement material shall be permanent and not leach any chemicals in to the ground.
4. Minimum 30 Kg of ground enhancement material shall be provided for each earth electrode.
5. Inspection chamber shall be of 400 x 500 mm with concrete base CI manhole cover with frame painted with bitumastic paint. 2 Nos. of 50 x 6 mm cross section & 300 mm long copper strip to be clamped with copper claded rod electrode have sufficient nos (But not less than 4 Nos.) of 10 mm GI nuts & bolts for connection to the equipment / interconnection to the other pits to form equi-potential bonding.

Testing At Site

1. Testing Of Earth Continuity Path: The earth continuity conductor including metal conduits and metallic envelopes of cable in all cases shall be tested for electric continuity and the electrical resistance of the same along with the earthing lead but excluding any added resistance of earth leakage circuit breaker measured from the connection with the earth electrode to any point in the earth continuity conductor in the completed installation shall not exceed one ohm.
2. Earth Resistivity Test: Earth resistivity test shall be carried out in accordance with IS Code of Practice for earthing IS 3043.

Section V- Wiring

General

1. Technical Specifications in this section cover the Internal Wiring Installation in concealed/surface conduit/raceways pertaining to:
    a. Lights and fans
    b. Convenience socket outlets
    c. Submain wiring

Standards and codes

2. Updated and current Indian Standard Specifications and Codes of Practice as stipulated below shall apply to the equipment and the work covered in this section. In addition the relevant clauses of the Indian Electricity Act 1910, Indian Electricity Rules 1956, National Building Code

1994, National Electric Code 1985, Code of Practice for Fire Safety of Building (general) : General Principal and Fire Grading – IS 1641 and IEE wiring regulation 16th edition as amended up to date shall also apply. Wherever appropriate Indian Standards are not available, relevant British and/or IEC Standards shall be applicable.

a.	660/1100 V grade FRLS PVC insulated wires.	IS	694 : 1990
b.	MS conduits for electrical wiring.	IS	9537 : Part I 1980
		IS	9537: Part II 1981
c.	Accessories for rigid steel conduits	IS	3837 : 1990
d.	Flexible steel conduits for electrical wiring	IS	3480 : 1990
e.	Switch socket outlets	IS	4615 : 1990
f.	3 pin plugs and socket outlets up to 250 volts	IS	1293 : 1988
g.	General and safety requirements for fluorescent lamps luminaries	IS	1913 : 1978
h.	Switches for domestic and similar purposes	IS	3854 : 1997
i.	Boxes for the enclosure of electrical accessories	IS	5133 : Parts I &II 1969
j.	Danger notice plates	IS	2551 : 1982
k.	Code of practice for personal hazard fire safety of buildings	IS	1644: 1998
l.	Code of practice for electrical installation fire safety of buildings	IS	1646 : 1997
m.	Code of practice for electrical wiring installations	IS	732 : 1989
n.	Code of practice of fire safety buildings (General- Electrical installations)	IS	1646 : 1982
o.	Guide for safety procedure and practices in electrical works	IS	5216 : 1982.

Materials (conduits & accessories)

1. MS Conduits

All conduits shall be of heavy gauge solid drawn ERW welded manufactured out of 16 (1.6mm) gauge MS Sheet up to 32mm dia and of 14 (2 mm) gauge for sizes higher than this. Both inner and outer surfaces shall be smooth without burrs, dents and kinks. Conduits shall be black stove enameled inside and outside. The cross section of conduit shall be uniform throughout. The welding shall be uniform such that welded joints do not yield when subjected to flattening test. Welded joint shall not break when threaded or bent at an angle. Conduit shall conform to specifications of IS: 9537 (Part-II) and the capacity of conduits shall be in accordance with the standards and shall never

be exceeded. The minimum size of the conduit shall be 20mm dia. Care shall be taken to ensure that all conduits are adequately protected while stored at site prior to erection and no damaged conduit shall be used.

2. Joints All jointing shall be subject to the approval of the Owner‘s site representative. The threads and sockets shall be free from grease and oil, Connections between screwed conduit and GI boxes shall be by means of hexagon brass check nut, fixed outside and brass bush from inside the box. The joints in conduits shall be free of burrs to avoid damage to insulation of conductors while pulling them through the conduits.
3. Recessed or Exposed conduit

   All conduits shall be as per Schedule of Quantities.
4. Flexible Conduit

   Wiring for short extensions to outlets in hung ceiling or to vibrating equipment, motors etc. shall be installed in flexible conduits. Flexible conduits shall be formed from a continuous length of spirally wound interlocked wire steel with a fused zinc coating on both sides. The conduit shall be provided with approved type adaptor. A separate and accessible earth connection shall bond across the flexible conduit.
5. Conduit Accessories.

   a. Standard accessories

   Heavy duty black enamel painted / galvanized standard conduit fittings and accessories like standard/extra-deep circular boxes, looping in boxes, junction boxes, solid /inspection elbows , solid/inspection tees, couplers, nipples, saddles, check nuts, earth clips, ball socket joints, bushes etc. shall be of superior quality and of approved makes. Heavy duty covers screwed with approved quality screws shall be used. Samples of all conduits fittings and accessories shall be got approved by Engineer-in-Charge before use.

   a. Fabricated accessories

      Wherever required, outlet/junction boxes of required sizes shall be fabricated from 1.6 mm thick MS sheets excepting ceiling fan outlet boxes which shall be fabricated from minimum 3 mm thick sheets. The outlet boxes shall be of approved quality, finish and manufacture. Suitable means of fixing connectors etc., if required, shall be provided in the boxes.

      The boxes shall be protected from rust by zinc phosphate primer process. Boxes shall be finished with minimum 2 coats of enamel paint of approved colour. A screwed brass stud shall be provided in all boxes as earthing terminal.

   b. Outlet Boxes for Light Fittings.

      These shall be minimum 75mm x 75mm x 50mm deep and provided with required number of threaded collars for conduit entry. For ceiling mounted florescent fittings, the boxes shall be provided 300 mm off centre for a 1200 mm fitting and 150 mm off centre for a 600 mm fitting so that the wiring is taken directly to the down rod. 3 mm thick perspex/hylam sheet cover of matching colour shall be provided.

   c. Outlet Boxes For Ceiling Fans

Outlet boxes for ceiling fans shall be fabricated from minimum 3 mm thick MS sheet steel. The boxes shall be hexagonal in shape of minimum 100 mm depth and 60 mm sides. Each box shall be provided with a recessed fan hook in the form of one 'U' shaped 15 mm dia rod welded to the box and securely tied to the top reinforcement of the concrete slab for a length of minimum 150 mm on either side. 3 mm thick Perspex/hylam sheet cover of matching colour shall be provided.

6. PVC Conduit and Accessories

Conduits and accessories shall conform to latest edition of IS-9537 part 3 and shall be heavy duty with minimum wall thickness of 2.0 mm rigid tubes which are unscrewed without coupling and with plain ends. All sections of conduit and relevant boxes shall be properly cleaned and glued by using epoxy resin glue and the proper connecting pieces. All conduits used shall be ISImarked and shall not be less than 20 mm diameter.

a. PVC conduit shall be used for all concealed / embedded installation.

b. PVC Conduit Accessories

c. Accessories used for conduit shall be of an approved brand and type complying with relevant IS code.

d. All accessories used shall be of standard white or black colour, identical to conduit used.

e. Plain conduits shall be joined by slip type of couplers with manufacturer‘s standard sealing cement.

f. All conduit entries to outlet boxes, trunking and switchgear are to be made with adaptors female thread and screwed male bushes.

g. PVC-switch and socket boxes with round knockouts are to be used. The colours of these boxes and the conduits shall be the same.

h. Standard PVC circular junction boxes are to be used with conduits for intersection, Teejunction, angle-junction and terminal. For the drawing-in of cables, standard circular through boxes shall be used.

i. Samples of accessories shall be submitted for approval prior to installation.

j. All jointing of PVC conduits shall be by means of adhesive jointing. Adequate expansion joints shall be allowed to take up the expansion of PVC conduits.

7. Bends in Conduit

Where necessary, bends or diversions may be achieved by means of bends and / or circular cast iron inspection boxes with adequate and suitable inlet and outlet screwed joints. In case of recessed system each junction box shall be provided with a cover properly secured and flush with the finished wall surface.

No bends shall have radius less than 7.5 cms or three times the outside diameter of the conduits. No run of conduit shall have more than four right angle bends from outlet to outlet. Bends in multi runs of conduits shall be parallel to each other and neat in appearance, maintaining the same distance as between straight runs of conduits.

8. Conduit Installation

a. System

9. The whole conduit system shall be installed to comply fully with relevant provision in Indian Standard Specifications, Indian Electricity Rules and IE wiring regulations.

10. Conduits shall be laid either recessed in walls and ceilings or on surface on walls and ceilings or partly recessed and partly on surface, as required. Same rate shall apply for recessed and surface conduiting in this contract. Stranded copper conductor insulated wire of size as per schedule of quantities shall be provided in entire conduiting for loop earthing. Steel wire of suitable size to serve as a fish wire shall be left in all conduit runs to facilitate drawing of wires after completion of conduiting.

    a. Installation

    Conduits shall be laid before casting in the upper portion of a slab or otherwise, as may be instructed or in accordance with approved drawings, so as to conceal the entire run of conduits and ceiling outlet boxes. Vertical drops shall be buried in columns or walls. Wherever necessary, chases will be cut by the contractor with the help of chase cutting m/c or by hand. Nothing extra shall be paid to the contractor on this account. In case of exposed brick/ rubble masonry work special care shall be taken to fix the conduit and accessories in position along with the building work. Sufficient depth of the chases will be made to accommodate the required number of conduits. The chase will be filled with cement, coarse sand mortar (1:3) and properly cured by watering for one week.

    If a chase is cut in an already finished surface the contractor shall fill the chase and finish it to match the existing finish. Contractor must not cut any iron bars to fix conduits. Conduits shall be kept at a minimum distance of 100mm from the pipes of other nonelectrical services. Where the conduit is to be embedded in a concrete member it shall be adequately tied to the reinforcement to prevent displacement during casting, conduits in chases shall be held by steel hooks of approved design at maximum of 100 cm centres. The embedding of conduits in walls shall be so arrangedas to allow at least 12mm plaster cover the same. All threaded joints of conduit pipes shall be treated with some approved ‗preservative compound' to secure protection against rust.

    b. Suitable expansion joints fittings of approved make and design shall be provided at all the points where the conduit crosses the expansion joint in the building.

    Separate conduit shall be used for:

    i. Normal light, fan call bell
    ii. 16 A power outlets
    iii. Emergency Light Point
    iv. Fire alarm System
    v. Computer Outlets
    vi. P.A System
    vii. Telephone system
    viii. TV Network
    ix. Or any other services not mentioned here.

    c. Conduit runs on surfaces shall be supported with metal 1.2 mm thick saddles, which in turn are properly secured on to GI spacer to the wall or ceiling. Fixing screws shall be with round or cheese head and of rust proof materials. Exposed conduits shall be neatly run parallel or at right angles to the walls of the building and shall be painted in color matching the adjoining area.

Cross cover of conduits shall be minimum and entire conduit installation shall be clean and with good appearance. For surface work, the boxes shall be raised back pattern type, designed for use with distance saddles to give clearance of 6mm between the back of conduit and the fixing surface.

d. Where conduits are run on steel work, they will be fixed by means of purpose made GI Caddy clips in manner meeting with the approval of the Engineer prior to the installation being carried out. Other methods of fixing may be agreed in special circumstances, but approval must first be obtained from the site engineer.

e. The spacing of saddles shall be not more than 600mm centers for up to 32mm diameter conduits and at 750mm for conduit sizes of 40mm diameter and above in case of MS conduit and not more than 600 mm for PVC conduit. In addition, saddles shall be fixed at each side of any bend/Tee, or set at a distance of 200mm from the bend/Tee.

f. Suitable size of boxes shall be provided a minimum of 2 adjustable fixing lugs on vertical sides. Suitable earth terminal inside each box shall be provided. All fixing lugs shall be threaded to receive standard machined chromium plated brass screws. Sufficient number of knockouts shall be provided for conduit entry. Conduits carrying wires of different circuit can terminate in common J.B having metal compartments. Necessary GI pull wires shall be inserted into the conduit for drawings wires. In case conduit pipe is required to cross any RCC beam special adopter boxes shall be provided for crossing & nothing shall be paid extra.

g. Particular care shall be taken during the progress of the work to prevent the ingress of dirt and rubbish such as plaster droppings into erected conduits. Conduit which has become so clogged shall be entirely freed from these accumulations or will be replaced. Screwed plastic or metal caps or turned wooden plugs shall be employed to protect all open ends. Plugs of waste wood, paper, cotton or other fibrous matter shall not be used. All unused conduit entries shall be blanked off in an approved manner and where conduits terminate in adaptable boxes, all removable box covers shall be firmly secured to provide complete enclosure.

h. All conduit installations must be completed and erected in their totality before they are wired and must be fully rewireable from outlets to distribution boards or trunking systems etc. to which they connect. No wiring of any part of the installation shall be commenced until instructions are received to do so by the Engineer-in-charge at such time as he is satisfied that the wiring will not be damaged due to building operations.

i. Conduits shall be installed so that they are self draining in the event of ingress of moisture due to condensation or any other reason. A suitable drainage hole shall be drilled at the bottom of the lowest conduit box in every 9-meter of horizontal run.

j. PVC bush of good quality shall be used in each conduit termination in a switch box, draw box, lighting fixtures and circular junction boxes.

k. Exposed conduits running above false ceilings shall be suitably clamped independently along with the dropped ceiling. Perforated straphangers or twisted attachment shall not be acceptable. In no case shall raceways be supported or fastened to other pipe for repair and maintenance. They shall be arranged symmetrically and in the cost compact design, in no way unduly criss-crossing each other. Proper spacing shall be maintained when two or more conduits run side by side. The layout of the pipes shall be coordinated with other services if any. The junction boxes and conduits used in hazardous areas shall be flameproof type with cast iron construction complete with threaded covers.

l. The conduit of each circuit or section shall be completed before conductors are drawn in. The entire system of conduit after erection shall be tested for mechanical and electrical continuity throughout and permanently connected to earth conforming to the requirements by means of special approved type of earthing clamp efficiently fastened to conduit pipe in a workman like manner for a perfect continuity between the earth and conduit.

m. The conduit system shall be so laid out that it will obviate the use of tees, elbows and sharp bends. No length of conduit shall have more than the equivalent of two-quarter bends from inlet to outlet. The conduit itself being given required smooth bend with radius of bends suiting to the site conditions but not less than 6 times overall diameter.

n. Outlet boxes shall be of heavy-duty sheet steel installed as to maintain continuity throughout. These shall be so protected at the time of laying that no mortar finds its way inside during concrete filling or plastering. For fluorescent fittings, the outlet boxes heavy duty shall be provided 300mm off centre for a 1200mm fitting and 150mm off centre for a 600mm fittings or as per B.O.Q.

o. Draw boxes of ample dimensions shall be provided at convenient points to facilitate pulling of long runs of cables. They shall be completely concealed with MS covers flush with plasterwork painted to match the wall.

Wiring capacity of conduits

1. Maximum number of PVC insulated 650/1100 V grade/copper conductor cable conforming to IS: 694-1990.

Conduit size	**20mm**		**25mm**		**32mm**		**40mm**		**50mm**		**60mm**	
Wire size in sq.mm.	**S**	**B**	**S**	**B**	**S**	**B**	**S**	**B**	**S**	**B**	**S**	**B**
1.5	7	5	12	10	20	14	-	-	-	-	-	-
2.5	6	5	10	8	18	12	-	-	-	-	-	-
4	4	3	7	6	12	10	-	-	-	-	-	-
6	3	2	6	5	10	8	-	-	-	-	-	-
10	2	-	4	3	6	5	8	6	-	-	-	-
16	-	-	2	-	4	3	7	6	-	-	-	-
25	-	-	-	-	3	2	5	4	8	6	9	7

2. Notes:

a. The above table shows the maximum capacity of conduits for a simultaneous drawing in of cables.

b. The columns heads ‗S'-Straight - apply to runs of conduits which have distance not exceeding 4.25 m between draw in boxes and which do not deflect from the straight by an angle of more than 15 degrees. The columns heads ‗B'- Bends - apply to runs of conduit which deflect from the straight by an angle of more than 15 degrees.

c. Conduit sizes are the nominal external diameters.

Switch outlets and junction boxes

All outlet boxes for switches, sockets and other receptacles shall be rust proof and shall be of 2 mm thick mild steel sheets with HOT dipped galvanizing (or as specified in BOQ), having smooth external and internal surfaces to true finish. All outlet boxes for receiving plug sockets and switches shall be fabricated to approved sizes. All boxes shall have adequate number of knock out holes of required diameter and earthing terminal screws. Outlet boxes shall be of a maximum depth of 65 mm.

Inspection boxes

Inspection boxes of 50 mm dia of cast iron shall have smooth external and internal finish to facilitate removal and replacement of wires, where required.

Fish wire

For drawing of wires in the conduit, GI fish wires of 2.0 mm (14 SWG) shall be provided along with the laying of recessed conduit.

Conductors

PVC insulated, Flame Retardant Low Smoke (FRLS) wires shall be single core unsheathed in voltage grade 1100 V as per IS 694 – 1990 with 99.97% pure electrolytic grade bright annealed stranded bare copper conductors. Special parameters of FRLS PVC insulation like critical oxygen index, temperature index, smoke density and flammability test shall conform to relevant IEC and ASTM Standards. Coil packing shall be ISI marked as stipulated in IS 694

Bunching of wires

Wires carrying current shall be so bunched that the outgoing and return wires are drawn into the same conduit. Wires originating from two different phases shall not run in the same conduit. All wires shall have ferrules for identification. Lighting and power circuits shall be separate.

Drawing conductors

1. The drawing and jointing of PVC insulated copper conductor wires shall be executed with due regard to the following precautions. While drawing wires through conduits, care shall be taken to avoid scratches and kinks which may cause breakage of conductors. There shall be no sharp bends. Wire reel stands to be used for pulling of wires to avoid kinks.
2. Insulation shall be removed by insulation stripper only. Strands of wires shall not be cut for connecting terminals. The terminals shall have sufficient cross sectional area to take all strands and connecting brass screws shall have flats ends. All looped joints shall be connected through terminal block/connectors. The pressure applied to tighten terminal screws shall be just adequate, neither too much nor too less. All light points shall be terminated through a connector.
3. All light points will terminated through a connector. Conductors having nominal cross sectional areas exceeding 10 sq.mm shall always be provided with cable sockets. At all bolted terminals brass flat washer of large area and approved steel spring washer shall be used. Brass nuts and bolts shall be used for all connections.
4. Only licensed wiremen (Before doing the work or before appointing him on site contractor has to

submit his wiring license to Owner) and cable jointers shall be employed to do jointing work. All wires and cables shall bear the manufacturer‘s label and shall be brought to site in original packing.

5. For all internal wiring. PVC insulated wires of 1100 volts grade shall be used. The sub-circuit wiring for point shall be carried out in loop system and no joints shall be allowed in the length of the conductors. No wire shall be drawn into any conduit until all work of any nature that may cause injury to wire is completed. Care shall be taken while pulling out the wires so that no damage occurs to conduits/wire itself, the conduits shall be thoroughly cleaned of moisture, dust, dirt or any other obstruction. The minimum size of PVC insulated copper conductor wires for all sub-circuit wiring for light points shall be minimum 2.5 sq.mm copper Separate neutral to be pulled for each circuit.

Joints

All joints shall be made at main switches, distribution boards, socket outlets, lighting outlets and switches boxes only. No joints shall be made in conduits and in junction boxes. Conductors shall be continuous from outlet to inlet.

Load balancing

Balancing of circuits in three phase installation shall be planned by the Consultants and shall be checked by the contractor before the commencement of wiring and shall be strictly adhered to.

Colour code of conductors

1. **Colour code for normal supply** – Red, Yellow, Blue for three Phases, Black for Neutral and Green for Earth – shall be maintained for the electrical wiring installation
2. **Colour code for UPS supply** – Red/white, Yellow/white, Blue/white for three Phases, white for Neutral and Green/yellow for Earth

Switches, receptacles (modular)

1. SWITCHES

   All switches shall be enclosed type flush mounted suitable for 240 volts AC. All switches shall be fixed inside the switch boxes on adjustable flat M S strips/plates with tapped holes and brass machine screws, leaving ample space at the back and sides for accommodating wires. Switch controlling the light point shall be connected to the phase wire of the circuit and not more than ten lights shall be connected on one circuit and load shall be restricted to 800 watts. All wiring accessories shall be BIS approved.

2. WALL SOCKET OUTLET

   Wall socket outlets shall be of the three pin. The switch controlling the socket outlet shall be on the phase wire of the circuit and not more than two socket outlets of 16 amps shall be connected on one circuit. An earth wire shall be provided along with the circuit wires and shall be connected to earthing screw inside the box. The earth terminal of the socket shall be connected to the earth terminal provided inside the box. All sockets shall be shuttered type.

   a. Every socket outlet shall be controlled by an individual switch unless mentioned otherwise.

   b. The switch controlling the socket outlet shall be on the `Live‘ side of the line.

   c. 6 amps and 16 amps socket outlet shall normally be fixed at any convenient height above the floor level based on request of Architect/Interior designer. The switch for 6 and 16 amps, socket outlet shall be kept along with the socket outlet. 16 amps socket outlet

in the kitchen of the residential or commercial buildings shall be fixed at any convenient height above working platform or as specified in drawings / schedule of equipment.

In a room containing a fixed bath or shower, there shall be no socket outlet and there shall be no provision for connecting a portable appliance. Any stationary appliance connected permanently in the bath room shall be controlled by an isolator switch or circuit breaker having outlets at such location where water / moisture does not effect.

a. Where socket outlets are placed at lower level, they shall be enclosed in a suitable metallic box with the system of wiring adopted or shutter type sockets shall be provided as specified.

b. In an earthed system of supply, a socket outlet and plug shall be of three pin type, the third terminal shall be connected to earth.

c. Conductors connecting electrical appliance with socket outlet shall be flexible twin cord with an earthing cord which shall be secured by connecting between the earth terminal of plug and the metallic body of the electrical appliance.

d. Where use of shutter type of interlocking type of socket is required for any special installation, the items should be separately and specifically listed in the Schedule of Quantities of that particular work.

Measurement of wiring

1. Wiring for lights, fans and convenience socket outlets shall be measured and paid for on **Point Basis** as itemized schedule of quantities and as elaborated as below (unless otherwise stated).
2. Average wiring Length.
    a. The point wiring basis for wiring for lights, fans and convenience socket outlets shall assume average wiring length and average conduiting length per point based on parameters stipulated in below. The average wiring length and average conduiting length forming the basis of point wiring payment, shall take the electrical layouts of the entire project into consideration.
    b. Tenderers are advised to seek clarifications, if they so desire, on this aspect before submitting their tenders. No claim for extra payment on account of electrical layouts in part or whole of the project requiring larger average wiring and conduiting length per point, whether specifically shown in tender drawings or not, shall be entertained after the award of contract.
3. Point wiring for Lights – Primary and Secondary Light Points.

    In respect of group control of lights (more than one light controlled by one switch or MCB), wiring up to the first light in the group shall be measured and paid for as a primary light point. Wiring for other lights looped in one group for switch controlled as also MCB controlled lights shall be measured and paid for as secondary light points. Primary light points for switch controlled lights shall include the cost of control switch whereas primary light points controlled by MCBs shall not include the switch cost. The cost of MCB controlling such lights shall not be included in the primary light point rate since the MCB shall be paid for in the item of DB. Primary light points shall include the cost of circuit wiring (wiring from DB terminal to the first switch in the sub circuit)

4. Design Parameters

    Wiring shall be carried out as per following design parameters in recessed/ surface conduit/conduit cum raceway system.

a. Only looping system of wiring shall be adopted throughout. No joints excepting at wiring terminals shall be permitted.

b. All accessories shall be flush type unless otherwise stated.

c. For estimation of load, following loads per point shall be assumed.

Light points	60/100 Watts.
6 amps socket outlet points	100 Watts.
Fan points	60 Watts.
Exhaust fan points	100 Watts unless otherwise specified.
16 amp socket outlet points	500/1000 Watts. Unless otherwise specified

d. Light and fan points shall be wired on a common final sub-circuit. Each sub circuit shall not have more than a total of 10 nos. lights and fans or a load of 800 watts whichever is lesser unless specifically stipulated otherwise. Wiring shall be carried out in MS conduiting system.

5. Scope of Point Wiring

Wiring for Lights

a. **Primary Light Points :** Wiring for Primary light points, as defined above, shall commence at the DB terminals and shall terminate at the ceiling rose/connector in ceiling box/lamp holder via the control switch (for switch controlled lights). Rates for Primary light point wiring shall be deemed to be inclusive of the cost of entire material and labour require for completion of Primary light point thus defined including : .

b. Recessed/surface conduiting system with all accessories, junction/draw/inspection boxes, bushes, check nuts etc. complete as required,

c. Wiring with stranded copper conductor FRLS PVC insulated 660/1000 volt grade wires including terminations etc. complete as required.

d. Control switch with switch box and cover plate of specified type including fixing screws, earth terminal etc. complete as required. Cost of this switch is applicable only for switch controlled points. This cost shall not be applicable for DB controlled Primary light points.

e. Loop earthing with insulated copper wires.

6. Secondary Light points :

Secondary light points shall cover the cost of interconnection wiring between group controlled light fittings and shall be deemed to be inclusive of the cost of entire materials and labour required for completion of the secondary light point thus defined including

7. Recessed / surface conduiting system with all accessories, junction/draw/inspection boxes,

a. bushes, check nuts etc. complete as required,

b. Wiring with stranded copper conductor FRLS PVC insulated 660/1000 volt grade wires including terminations etc. complete as required.

c. Loop earthing with insulated copper wires.

8. Wiring for Ceiling Fans

   Wiring for ceiling fan points shall be same as for Primary light points and shall, in addition, include ceiling outlet box with recessed fan hooks and installation of fan regulator.

9. Wiring for Exhaust Fans

   Wiring for exhaust fan points shall be same as for Primary light points and shall in addition include the cost of providing a 3/5 pin 6 amp socket outlet near the fan along with plug top and a separate 6 amp control switch.

10. Wiring for Convenience Socket Outlets

    Wiring for 6 amps socket outlets on work tables shall be carried out partly in MS conduits and partly in MS raceways as indicated in electrical layout drawings. Wiring for socket outlets (6 amps as well as 16 amps) in locations other than workstations shall be carried out in MS conduits only.

11. Point wiring for 3 pin 6 amps convenience socket outlets

    Point wiring for 3 pin 6 amps socket outlets on point wiring basis shall be the same as Primary light points defined in para 3.17.4.1 and shall in addition include 3 pin 6 amp socket outlet with 6 amp control switch in GI box with cover. Including loop earthing of the third pin complete as required and as itemized in scheduled of quantities.

12. Point wiring for 3 pin 16 amps convenience socket outlets

    Point wiring for 3 pin 16 amps socket outlets on point wiring basis shall be the same as Primary light point defined in para 3.17.4.1 and shall in addition include 3 pin 16 amp socket outlet with 16 amp control switch in MS box with cover. Including loop earthing of the third pin complete as required and as itemized in scheduled of quantities.

13. Sub-mains Wiring

    Sub-mains wiring shall be measured and paid for on linear basis as per the length of conduit actually installed between terminations. This shall include conduit system with all accessories, wires and insulated loop earthing conductors as itemised in schedule of quantities. The quoted rates shall include termination of wiring at either end. Cost of wires only without conduits at either end required for end terminations and taken inside switchboards etc. shall be deemed to be included in the liner running meter rate of Submain wiring in conduit and no extra shall be paid for such additional wiring without conduit.

Section – VI: Cabling For Voice, Data System

Scope

This document defines the cabling system and subsystem components to include cable, termination hardware, supporting hardware, and miscellany required to furnish, and to install a complete cabling infrastructure supporting voice and video. The intent of this section is to provide pertinent information to allow the vendor to bid the labour, supervision, tooling, materials, and miscellaneous mounting hardware and consumables to install a complete system. However, it is the responsibility of the vendor to propose any, and, all items required for a complete system whether or not it is identified in the specification, drawings and bill of materials attached to this specification.

Applicable documents

The cabling system described in this specification is derived in part from the recommendations made in industry standard documents. The list of documents below (or the latest revisions) has bearing on the desired cabling infrastructure are incorporated into this specification by reference:

a. This Technical Specification and Associated Drawings

b. ANSI/TIA/EIA 568-B Commercial Building Telecommunications Cabling Standard – March 2001

c. ANSI/EIA/TIA-569-A Commercial Building Standard for Telecommunications Pathways and Spaces - February, 1998

d. ANSI/EIA/TIA-606 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings - February, 1993

e. ANSI/TIA/EIA-607 Commercial Building Grounding and Bonding Requirements for Telecommunications - August, 1994

Telephone network Telephone Tag Block:

General

1. The telephone tag blocks shall be suitable for the multi core telephone cables and shall have two terminal blocks, cross connect type. All incoming and outgoing cables shall be terminated on separate terminal blocks and termination shall be silver soldered. The cross connecting jumpers shall be insulated wires of same diameter and screw connected.
2. The tag blocks shall be mounted inside fabricated sheet steel boxes with removable hinged covers and shall be fully accessible. The enclosure shall be painted with 2 coats of red oxide and stove enamelled.
3. CAT-5e (enhanced) unshielded twisted pair cable in MS/PVC conduit shall be used to have modern structured cabling network for telephone system, to have latest facilities for Internet and also data cabling. All the telephone Jack must terminated on RJ-11 jacks and installed onto a dual Jack faceplate. Telephone RJ-11 Jacks must be terminated with a Connector/Jack.

Equipment room

The equipment room shall be defined as an area within the building where telecommunications systems shall be housed along with the mechanical termination of one or more portions of the telecommunications wiring system.

Equipment room shall be considered to be distinct from telecommunications closets because of the nature or complexity of the equipment they contain. Any or all of the functions of a telecommunications closet shall be alternatively provided by an equipment room. 6.3.6.5. Cable specifications 1. UTP cabling system

Unshielded twisted pair cabling system, TIA / EIA 568-B.1 addendum Category 5e Cabling system	
a. Networks Supported	10 / 100 Ethernet, 155 Mbps ATM, 1000 Mbps IEEE 802.3ab Ethernet, and proposed Cat 6 Gigabit Ethernet
b. Warranty	25-year systems warranty; Warranty to cover Bandwidth of the specified and installed cabling system, and the installation costs
c. Performance characteristics to be provided along with bid	Attenuation, Pair-to-pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR for 4-connector channel

Unshielded Twisted Pair, Category 6, TIA / EIA 568-B.2	
a. Material:	
b. Conductors	23 AWG solid bare copper or better
c. Insulation	Polyethylene
d. Jacket	Flame Retardant PVC
e. Pair Separator	Cross-member fluted Spline.
f. Approvals	UL Listed
	ETL verified to TIA / EIA Cat 6
g. Operating temperature	-20 Deg. C to +60 Deg. C
h. Frequency tested up to	Minimum 600 MHz
i. Packing	Box of 305 meters
j. Delay Skew	45ns MAX.
k. Impedance	100 Ohms + / - 15 ohms, 1 to 600 MHz.
l. Performance characteristics to be provided along with bid	Attenuation, Pair-to-pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR

2. Category 5 Riser Cable

This cable shall consist of solid copper conductors insulated with expanded polyethylene covered by a PVC sheet.

The core shall be covered with a layer of plastic tape and overlaid with a corrugated PVC plastic. It shall be suitable to be used without conduit. The cable shall meet. EIA/TIA -568, C S A T 529, IEEE 802.3 & 10 B A S E -T. The pair sizes shall be as per the schedule of quantities. The cable shall meet the following specifications.

a. Maximum DC Resistance 26.5 ohm per 100 ft.

b. Maximum DC Unbalanced Resistance 17%

c. Mutual Capacitance at 1 Khz 16 nF per 1000 ft.

Testing

All the ports post termination should be tested to avoid any future data packet loss using Penta scanning.

1. All the test result with complete documentation should be taken from cabling vendor.
2. Testing of network site should be as per EIA/TIA standard for 20/25 years network guarantee and certification on passive components.
3. Testing & labelling:
    a. All fiber-optic cables and connectors shall be tested.

b. All voice cables and connectors shall be tested for continuity and pin-out as well as live circuit operation.

c. All date cables, connectors and patch cables shall be tested to EIA /TIA *568 specification using a Penta Scanner.

d. All Cables, racks, enclosures, patch panels, blocks and faceplate shall be professionally and clearly labelled using an electronic labelling devise in accordance with planned network labelling scheme.

Warranty

Owner seeks warranty for the installed cable plant from the OEM equipment supplier. Bidder shall ensure that the OEM norms for supply, installation, testing and documentation as specified by the OEM supplier shall be adhered to, provided those are in line with TIA / EIA standards and Owner requirement specifications. The warranty shall be provided by the OEM vendor to Owner and shall be administered in India. The duration of the warranty shall be for a minimum of 25 years and shall cover the system performance, application assurance and the costs of the supply of components and installation.

6.3.7. Section –VII: Cabling For Data System

Scope

This document defines the cabling system and subsystem components to include cable, termination hardware, supporting hardware, and miscellany required to furnish, and to install a complete cabling infrastructure supporting data and video. The intent of this section is to provide pertinent information to allow the vendor to bid the labour, supervision, tooling, materials, and miscellaneous mounting hardware and consumables to install a complete system. However, it is the responsibility of the vendor to propose any, and, all items required for a complete system whether or not it is identified in the specification, drawings and bill of materials attached to this specification.

Applicable documents

The cabling system described in this specification is derived in part from the recommendations made in industry standard documents. The list of documents below (or the latest revisions) has bearing on the desired cabling infrastructure are incorporated into this specification by reference:

This Technical Specification and Associated Drawings

ANSI/TIA/EIA 568-B Commercial Building Telecommunications Cabling Standard – March 2001

ANSI/EIA/TIA-569-A Commercial Building Standard for Telecommunications Pathways and Spaces - February, 1998

ANSI/EIA/TIA-606 Administration Standard for the Telecommunications Infrastructure of

1. Commercial Buildings - February, 1993
2. ANSI/TIA/EIA-607 Commercial Building Grounding and Bonding Requirements for Telecommunications - August, 1994

Cabling system and component specifications

1. UTP Cabling System

Unshielded twisted pair cabling system, TIA / EIA 568-B.1 addendum Category 6 Cabling system

Networks Supported	1000 Ethernet, 155 Mbps ATM, 1000 Mbps IEEE 802.3ab Ethernet, and proposed Cat 6 Gigabit Ethernet

Warranty	25-year systems warranty; Warranty to cover Bandwidth of the specified and installed cabling system, and the installation costs
Performance characteristics to be provided along with bid	Attenuation, Pair-to-pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR for 4connector channel

Unshielded Twisted Pair, Category 6, TIA / EIA 568-B.2

Material:	
Conductors	23 AWG solid bare copper or better
Insulation	Polyethylene
Jacket	Flame Retardant PVC
Pair Separator	Cross-member fluted Spline.
Approvals	UL Listed
	ETL verified to TIA / EIA Cat 6
Operating temperature	-20 Deg. C to +60 Deg. C
Frequency tested up to	Minimum 600 MHz
Packing	Box of 305 meters
Delay Skew	45ns MAX.
Impedance	100 Ohms + / - 15 ohms, 1 to 600 MHz.
Performance characteristics to be provided along with bid	Attenuation, Pair-to-pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR

2. UTP Jacks

Type	**PCB based, Unshielded Twisted Pair, Category 6, TIA / EIA 568-B.2**
Durability	
Modular Jack	750 mating cycles
Wire terminal	200 termination cycles
Accessories	Strain relief and bend-limiting boot for cable
	Integrated hinged dust cover
Materials	
Housing	Polyphenylene oxide, 94V-0 rated
Wiring blocks	Polycarbonate, 94V-0 rated
Jack contacts	Phosphorous bronze, plated with 1.27micro-meter thick gold
Approvals	UL listed
Performance Characteristics to be provided with bid	Attenuation, NEXT, PS NEXT, FEXT and Return Loss

3. UTP Jack Panels

Type	**24-port, PCB based, Unshielded Twisted Pair, Category 6, TIA / EIA 568-B.2**
Ports	24
Port arrangement	Modules of 6-ports each, arranged 1port x 6.
Category	Category 6
Circuit Identification Scheme	Icons on each of 24-ports
Port Identification	9mm or 12mm Labels on each of 24-ports (to be included in
supply) Height	1 U (1.75 inches)
Durability	
Modular Jack	750 mating cycles
Wire terminal (110 block)	200 termination cycles
Accessories	Strain relief and bend limiting boot for
cable Materials	
Housing	Polyphenylene oxide, 94V-0 rated
Wiring blocks	Polycarbonate, 94V-0 rated
Jack contacts	Phosphorous bronze, plated with 1.27micro-meter thick gold
Panel	Black, powder coated steel
Approvals	UL listed
Termination Pattern	TIA / EIA 568 A and B;

Performance Characteristics to be Attenuation, NEXT, PS NEXT, FEXT and Return Loss provided along with bid

4. Faceplates

Type	**1-port, White surface box**
Material	ABS / UL 94 V-0
No. of ports	One

5. Workstation / Equipment Cords

Type	**Unshielded Twisted Pair, Category 6, TIA / EIA 568-B.2**

Conductor	24 AWG 7 / 32, stranded copper
Length	7-feet
Plug Protection	Matching colored snag-less, elastomer polyolefin boot
Warranty	25-year component warranty
Category	Category 5
Plug	
Housing	Clear polycarbonate
Terminals	Phosphor Bronze, 50 micron gold plating over selected area and gold flash over remainder, over 100 micron nickel under plate
Load bar	PBT polyester
Jacket	PVC
Insulation	Flame Retardant Polyethylene

Wireless Signal: The color of this parameter‘s progress bar provides a visual Interpretation of signal strength. Values are given below

Excellent (green) : -57 to -45 dBms (75 to 100 %)

Good (green) : -75 to -58 dBms (40 to 74 %)

Fair (Yellow) : -85 to -76 dBms (20 to 39 %)

Poor (Red) : -95 to -86 dBms (0 to 19 %)

The guest rooms should have excellent wireless coverage.

Note: Termination of active & Passive components shall be the part of system Integrator

Testing

1. All the ports post termination should be tested to avoid any future data packet loss using Penta scanning.
2. All the test result with complete documentation should be taken from cabling vendor.
3. Testing of network site should be as per EIA/TIA standard for 20/25 years network guarantee and certification on passive components.
4. Testing & labelling:
    a. All fiber-optic cables and connectors shall be tested.

b. All voice cables and connectors shall be tested for continuity and pin-out as well as live circuit operation.

c. All date cables, connectors and patch cables shall be tested to EIA /TIA *568 specification using a Penta Scanner.

d. All Cables, racks, enclosures, patch panels, blocks and faceplate shall be professionally and clearly labelled using an electronic labelling devise in accordance with planned network labelling scheme.

Warranty

Owner seeks warranty for the installed cable plant from the OEM equipment supplier. Bidder shall ensure that the OEM norms for supply, installation, testing and documentation as specified by the OEM supplier shall be adhered to, provided those are in line with TIA / EIA standards and Owner requirement specifications. The warranty shall be provided by the OEM vendor to Owner and shall be administered in India. The duration of the warranty shall be for a minimum of 25 years and shall cover the system performance, application assurance and the costs of the supply of components and installation.

6.3.8. Section – VIII: LT Switchboards

General

Part II: Circuit Breakers

Part III: Switches, disconnectors, Switch disconnectors and fuse combination units Part IV: Contactors and Motor starters

Part V: Control circuit devices and switching elements

Marking of Switchgear busbars	IS 11353: 1985
Degree of Protection of Enclosures for low voltage switchgear.	IEC 60529
Electrical relays for power system protection	IS 3231: 1986
Code of Practice for selection, installation and Maintenance of switchgear & control gear	IS 10118: 1982
Low voltage switchgear & control gear assemblies	IEC 60349
Danger notice plates	IS 2551: 1982

Testing

1. Original test certificate of the MCCB as per IEC 60947-1 &2 or IS13947 shall be furnished.
2. Pre-commissioning tests on the switch board panel incorporating the MCCB shall be done as per standard specifications.
3. All MCCB with microprocessor based release unit, the protection shall be adjustable Overload, Short circuit and earth fault protection with time delay.

4. The trip command shall override all other commands.

Section IX: Switchboards

General

1. Switchboards shall be suitable for operation at three phase 4 wire, 415 volt, 50 Hz, neutral solidly grounded at transformer system with a short circuit level withstand as per schedule of quantities and drawings.
2. Switchboards shall comply to Form 3B for compartmentalized boards and Form 1 for noncompartmentalized boards as per BS 5486 Part I – 1990 and IEC 439-1
3. The enclosures shall be designed to take care of normal stress as well as abnormal electromechanical stress due to short circuit conditions. All covers and doors provided shall offer

Specifications for Manually Operated Fire Detection and Alarm System

General description:

Scope

This specification covers the supply, installation, testing and commissioning of the Fire Alarm Systems and generally comprise

1. Provision of Manual Call Points
2. Provision of Hooters
3. Local Control Unit for the System
4. Wiring between MCP, Hooter and Control Units to make the complete System

Standards and codes

All equipment and the installation shall be as per the relevant Indian Standards Specifications. Where these Standards do not exist, the relevant British Standards or any other internationally accepted Standard shall apply.

Manual call points

Manual Call Points shall consist of a push button switch housed in a dust tight sheet steel enclosure of 1.5 mm thick sheet to manually initiate audio visual alarms. The front shall be sealed with a breakable glass cover fixed in such a way that the actuating push button is kept depressed as long as the glass is intact and released automatically when the glass is broken. The front face of the Manual Call Box shall have an area not less than 5000 sq mm and the element shall have an exposed area of not less than 1600 sq mm in the shape of a square or a rectangle.

A small steel hammer shall be attached to the assembly with a steel chain to facilitate breaking of the glass front. The Manual Call Box shall be suitable for surface or recessed mounting as required. The words "IN CASE OF FIRE BREAK GLASS" 5 mm high shall be painted in red on the front face.

Hooter

Electronic audio alarm sirens shall be suitable for operation on the DC supply of the System and will be actuated from the Main Control Panel in the event of a fire. These shall have a two tone modulated alarm signal for continuous service with an output of 89 dB at a distance of 3 meters.

Main control panel

General

The Main Control Panel (MCP) shall be located at entrance and shall form the nerve centre of the total System.

Constructional features

The MCP shall be metal enclosed, sheet steel cubicle pattern, dead front, floor/wall mounting type as required and suitable for indoor mounting.

The MCP shall be dust and vermin proof. Synthetic rubber gaskets shall be provided on all covers and doors to render the joints dust and vermin proof. All doors shall be lockable.

1. The MCP shall be fabricated from 2.0 mm CRCA thick sheet steel and shall be folded and braced to provide a rigid support. Joints shall be seam welded.

Appendix 2: List of makes 8.2.1.

Approved makes for Civil and other works

S. No.	Details of Materials / Equipment	Manufacturer's Name
	Civil items	
1	Cement	Ultratech/ Ambuja 53 Grade
2	White Cement	Birla White
3	Wall Tiles - Vitrified	Johnson/ Nitco/ Kajaria/ Regency
4	Floor tiles – toilet and pantry	Johnson/ Nitco/ Kajaria/ Regency
5	Plumbing fixtures	Jaguar
6	UPVC Pipes	Tata/ Zenith
7	CPVC Pipes	Tata/ Zenith
8	Sanitary wares	Hindware/ Parryware/ NYCER
9	Polycorbonate Sheet	Durotuf/ Tufflite/ Duroshine
10	Puff Panel	E-Pack/ Swarn Telecome/ E-Vision
11	Water Proofing	Bitumege/ Makphalt/ Torch Shield
12	Geotextile	Wishva/ Maccaferri/ Mirafi
13	Acp	Nice Bond/ Indo Bond/ Alstone
14	Ss Grating	Belly Drain/ Mifab/ Acodrain
15	Lift	Otis/ Schindler/ Kone
	Carpentry Items	
1	Commercial plywood	Century-Sainik/ Gamet/ Samrat or equivalent
2	MDF	Duratuff/ Nuwood
3	Flush door	Green/ Galaxy

	Hardware items	
1	Aluminum section	Jindal or equivalent Geeta/ Hinda
2	Floor spring	Hyper/ Archies or equivalent
3	Door closure	Hyper/ Hardware or equivalent
4	Door stopper	Local as per item
5	Glass handles	Local as per item
6	Door Hinges – Brass	Maruti
7	Shutter Hinges	Maruti
8	Latch	Godrej/ Tag
9	Tower Bolt	Godrej
10	Cylindrical lock	Godrej
11	Door lock	Godrej/ Vijayan
12	Drawer lock	Godrej
15	Pedestal lock	Godrej
16	Screws	Laxmi/ GKW
S. No.	Details of Materials / Equipment	Manufacturer's Name
	Paint, Ceiling and Flooring	
1	Glazing	Modi/ Saint Gobain
2	Gypsum	Gypsam /Arm Strong/ Anutone
3	Paint	Asian/ Berger/ Nerolac

Approved makes for Plumbing works

S. No.	**Details of Materials / Equipment**	**Manufacturer's Name**
1	uPVC Pipe and fittings	Supreme, Prince, AKG
2	RCC Pipe	Pragati, Krishna Spun Pipe, OM spun pipe
3	C.I Manholes cover	Neco, Kartar, Rif
4	SFRC Manhole Cover & Grating	ABC-Accurate, Surabh

a. Approved makes for Electrical, Fire-fighting and other works

S. No.	**Details of Materials / Equipment**	**Manufacturer's Name**
A	**Medium Voltage Equipment**	

1	Power Distribution Panel	Ambit Switchgear Precision System Control Tricolite Application Control Panel Pvt. Ltd
2	Final Distribution Board	Hager-Novello Legrand Ekinox3 Siemens Beta Guard 10KA Schneider - Acti9
3	Moulded Case Circuit Breaker (MCCB)	ABB Tmax Legrand - DPX3 L&T DU sine Schneider - NSX Siemens 3VL
4	Miniature Circuit Breakers	ABB Hager-H3 Legrand - DX3 Siemens Beta Guard 10KA Schneider - Acti9
5	Residual Current Circuit Breaker (RCCB)	ABB Hager-H3 Legrand - DX3 Siemens Beta Guard 10KA Schneider - Acti9
6	Power/Aux. Contactor	ABB AF L&T- MNX Legrand CTX3 Siemens Sirius RT Schneider Tesys K, D, F
7	Control Transformer/Potential Transformers	Automatic Electric Gilbert & Maxwell Indcoil Pragati Precise Matrix
8	Current Transformer (Epoxy Cast Resin)	Automatic Electric Gilbert & Maxwell Indcoil Pragati Precise
9	Protection Relay (Numeric Type)	ABB Areva L&T Siemens
10	Indicating Lamps LED type and Push Button	GE Power Controls Larsen & Toubro (ESBEE) Schneider Electric Siemens

11	Overload relays with built in Single Phase preventer	ABB GE Power Controls Larsen & Toubro Mitsubishi Electrical Schneider Electric Siemens
12	Electronic Digital Meters (A/V/PF/Hz/KW/KWH) with LED Display	Automatic Electric L & T Schneider Electric
13	Static Power Meter & Logger (SPML)With RS 485 port	Conzerv Larsen & Toubro Schneider Electric Automatic Electric
14	PVC insulated XLPE aluminium/copper conductor armoured MV Cables upto 1100 V grade	Finolex Universal Havells Paramount
15	LT Jointing Kit / Termination	Birla-3M Raychem REPL Safe Kit
16	Cable Glands Double Compression with earthing links	Baliga Lighting Comet Cosmos
17	Bimettalic Cable Lug	Comet Cosmos Dowell‘s (Biller India) Hax Brass (Copper Alloy India)
18	PVC insulated copper conductor stranded flexible wires (FRLS)	Finolex Universal Havells Paramount
19	Mettalic / GI Conduit (ISI approved)	RM-Con(AKG) BEC NIC Vimco

20	PVC Conduit & Accessoires (ISI approved)	AKG BEC Polypack Precision
21	Lead Coated Flexible GI Conduit	PLICA IndiaPvt. Ltd. Flexicon ABB – Lumina/ Classic
22	Switch & Socket	Legrand - Arteor Clipsal NEO C-Metro ABB - Concept BS
23	Industrial Socket Splash Proof	Legrand Gewiss Schneider Electric
24	Industrial Socket Metal Clad	Hansel MDS Legrand
25	Ceiling Fan	Crompton Greaves Havells Bajaj Usha
26	Lighting Fixture LED	Philips India Wipro Bajaj Polycab
27	UPS	APC Schneider Emerson Network Power ABB BPE
28	Lighting & Surge Voltage Protection	ABB Hager ObeoBetterman Schneider Electric

29	230/12 V Step Down Transformer with BUILTIN Isolation Transformer	Talema Volstat
30	Energy saving Units	FMS Inncom Inn Link Systems Pumba Electronics
31	Exit Signage's	Legrand MK Prolite Philips Thorn
32	Cable tray	Ricco Slotco Indiana Engineering
33	Raceway	Legrand - CMS MK Schneider
B	Telephone	
a)	Cat-6 Cable	Legrand - LCS2 Panduit(Pannet) Siemon
b)	Fiber Optic Cable	Legrand - LCS2 Panduit(Pannet) Siemon
c)	Telephone Tag Blocks	KRONE Om Enterprises

2.	Telephone Armoured Cables	DELTON CABLES FINOLEX SKYTONE
3.	Patch Cords, patch panels, Splitter Box, cross connect outlet	Legrand - LCS2 Panduit(Pannet) Siemon
4.	Data Switches, Receiver, Media Converter	ALCATEL CISCO EXTREME H.P
5.	WiFi(AP's)	ALTAI COMPEX MOTOROLA RADMAX RUCKUS
6.	Racks for Data Switches	Legrand - LCS2 Rittal APW
7.	EPABX	Avaya Honeywell Alcatel Siemens

1. GENERAL REQUIREMENT

A. FOR LIFTS.

1. The lift shall be suitable / compatible for integration with fire alarm system signals and capable of entering into 'Emergency Fire Mode Service' by operation of break glass panel of the Fireman's lift. “FIRE MAN SWITCH” shall be provided to ground the lifts and use them as “FIRE LIFT” as per local statutory regulation.
2. The doors of Lift car and Hoist way landing openings shall have safety device of both Mechanical safety edge protective system and infrared curtain Electronic Door detector device) to retract door operation in case of intrusion if any.
3. Lift car shall have in built load measuring (weighing) device required for adjustment of starting torque to keep the car jerk free at start apart from sensing overload and stopping movement of the car in that load condition by keeping its door open and sounding the buzzer in the car or bypassing further hall calls if the car is loaded to designed capacity.
4. The techniques of Variable Voltage Variable frequency type drive shall be of to limit motor starting current to less than 1.8 times the nominal motor current.
5. The operation control shall have device for car landing at floor level (s) without creeping speed while levelling which accuracy shall be within ± 3 mm
6. Better quality of installation shall be ensured preferably by adopting scaffold less erection.
7. The Lift control system shall also have the following features in addition to those otherwise specified in the Bid.

a) .Bypass load function to cancel hall calls in the intermediate floors in case lift in nearly to its capacity temporarily without jeopardizing the call registered till the floor is served.

b) .Automatic cancellation of down calls during up-peak traffic service of the lifts.

c) Redundancy & reliability for efficient functioning of Lifts of a group in case of any one or more lift(s) is / are out of operation due to maintenance or otherwise without sacrificing any features of the functioning lifts.

d) Flashing of hall lantern to indicate arrival of a particular Lift car at landing. e.Flexible choice of multiple parking zones.

e) Cancellation of false calls by counting stops through photocell in the lift door.

8. **Door Open Time:**
The door opening time at any floor shall be capable of being set at site depending on the site conditions. Also, the door open time at the main floor can be set differently to suit the need.
9. **Special Function floors:**
The system shall have software facility to select or designate different type of floors depending on the requirement of the building to match the lift service effective under different conditions.
10. The lift safety mechanisms shall include the provision of Automatic Rescue Device (ARD) to rescue the stranded lift passengers in the event of a power failure, operated on dry maintenance - free batteries/UPS of required capacity to continuously monitor the normal power supply in the main elevator controller and activate rescue operation within ten seconds of a power failure by which the lift is brought to the nearest landing and doors remain open.
11. The CCTV provision in the lift shall be integrated with the existing surveillance system

GENERAL / DETAILED SPECIFICATIONS FOR LIFT

I. Inspection and testing:

Copies of all documents of routine and type test certificates of the equipment, carried out at the manufacturers premises shall be furnished to the Engineer-in-charge and consignee.
After completion of the work in all respect the contractor shall offer the installation for testing and operation.

Compliance with regulations and Indian standards

All works shall be carried out in accordance with relevant regulation, both statutory and those specified by the Indian Standards related to the works covered by this specification. In particular, the equipment and installation will comply with the following:

(i) Factories Act.
(ii) Indian Electricity Rules.
(iii) IS & BS Standards as applicable.
(iv) Workmen's compensation Act.
(v) Statutory norms prescribed by local bodies like CEA, NDMC etc.

Nothing in this specification shall be construed to relieve the successful tenderer of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with currently applicable statutory regulations and safety codes.

Successful tenderer shall arrange for compliance with statutory provisions of safety regulations and departmental requirements of safety codes in respect of labour employed on the work by the tenderer. Failure to provide such safety requirement would make the tenderer liable for penalty of Rs. 50/- for each default. In addition, the department will be at liberty to make arrangement for the safety requirements at the cost of tenderer and recover the cost thereof from him.

a) Drawings:

The work shall be proceeded with the preparation of the general arrangement drawings based on the site/building plans handed over for the purpose and submission of the same for approval of the Architects according to the time Schedule specified. Any doubt on dimensions shall be got cleared by verifying at site/building under construction.

Detailed drawings of all items/components, which are to be provided for in the construction by other agencies such as Main Contractor for Civil and associated works or Electrical Contractor, shall also be furnished well ahead of the

requirement. Approvals of the drawings shall be sought from the Project Engineer before handing over to the agencies for execution.

Erection Tools

No tools and tackles either for unloading or for shifting the equipment's for erections purposes would be made available by the department. The successful tenderer shall make his own arrangement for all these facilities.

Cooperation with other agencies

The successful tenderer shall co-ordinate with other contractors and agencies engaged in the construction of building, if any, exchange freely all technical information so as to make the execution of this works contract smooth. No remuneration should be claimed from the department for such technical cooperation. If any unreasonable hindrance is caused to other agencies and any completed portion of the work has to be dismantled and re-done for want of cooperation and coordination by the successful tenderer during the course of work, such expenditure incurred will be recovered from the successful tenderer if the restoration work to the original condition or specification of the dismantled portion of the work was not undertaken by the successful tenderer himself.

Insurance and Storage

All consignments are to be duly insured the cost of the supplier. The insurance covers shall be valid till the equipment is handed over duly installed, tested and commissioned.

Verification of correctness of Equipment at Destination

The contractor shall have to produce all the relevant records to certify that the genuine equipment from the manufactures has been supplied and erected.

Interpreting Specifications

In interpreting the specifications, the following order of decreasing importance shall be followed in case of contradictions:

(a) Schedule of quantities
(b) Technical specifications
(c) Drawing (if any)
(d) General Specifications

Relevant IS or other international code in case IS code is not available.

TECHNICAL SPECIFICATION

The contractor shall be supply and install lift as per specifications (Schedule of Requirement) placed in tender at Annexure - I.

The work shall be executed as per CPWD General Specifications for Electrical Works (Part III Lifts & Escalators - 2003) as per relevant IS and as per directions of Engineer-in-charge. These additional specifications are to be read in conjunction with above and in case of variations; specifications given in this additional conditions shall apply. However, nothing extra shall be paid on account of these additional specifications & conditions as the same are to be read along with scheduled of quantities for the work.
The tenderer should in his own interest visit the site and familiaries himself with the site conditions before tendering.

No T & P shall be issued by department and nothing extra shall be paid on account of this.

Note:

- ***If any item/ s not mentioned in make list or not cleared in the RFP, approval for the same to be taken by EI.***

- ***The successful bidder should provide technical data for all items which are placed at Annexure - II before placing order of lift.***

Annexure – I

SPECIFICATION (SCHEDULE OF REQUIREMENT)

PASSENGER LIFT

1.	Capacity / Weight	:	13 Persons / of adequate capacity for shaft size mentioned below
2.	Quantity	:	1 No.
3.	Speed	:	1 m/s
4.	Type of Drive	:	ACVF / As suggested by Agency
5.	Type of Lift	:	Machine Room less/Gearless
6.	Travel	:	As per existing lift shaft
7.	Serving	:	Three Floor Building operation at ground floor and 3rd floor.
8.	Floors	:	G+3 floors (2 stops G and Top floor).
9.	Well Size / Shaft Size	:	As per site
10.	Car Size (Aprrox.)	:	As per standard and lift shaft size
11.	Car Enclosure, Door	:	Stainless Steel Hairline
12.	Flooring	:	Granite Flooring finish color as per E/I
13.	Landing door	:	Fully automatic landing door ,
14.	Fan and Light	:	Auto on/OFF, sweep twin blower or as per E/I
15.	No. of Car Entrance	:	One location front – Centered
16.	Car & Hoist way Entrance Door	:	Centre opening, stainless steel as per E/I
17.	Clear Entrance	:	As per Site
18.	Operation	:	Automatic
19.	Standard Features	:	Close loop control system 2hr fire rated landing door, Power protect against fluctuation, Self diagonistic control, Overload detection, ARD, automatic rescue to nearest floor, Infrared curtain on car entrance, Alarm horn

20.	Indicator (Car & Landing) & Features	:	▪ Digital direction and position. ▪ 16 segment display ▪ Car position indicator ▪ Pre announcing arrows for collective control ▪ Inverter based emergency light. ▪ System capable of with standing +10% to -10% supply voltage fluctuation. ▪ Fireman switch. ▪ VF door operator. ▪ Inverter based emergency alarm. ▪ Full height Infrared curtain. ▪ Adjustable guide shoes ▪ Intercom 3 way ▪ Fireman Control
21.	PIT Depth	:	As per standard
22.	Hand Rail	:	As per E/I
23	Ceiling		Deco Ceiling Finish in Stainless Steel Hairline or as per E/I
24	Mirror		Full height Mirror in rear car panel

Annexure – II

TECHNICAL DATA

The successful bidder should provide technical data for all items which are placed at Annexure - II before placing order of lift. The Contractor shall guarantee performance of each equipment as per technical data furnished.

Sl. No.	Short Description	Data
1)	Manufacturer	
2)	Lift Capacity (KG)	
3)	Quantity	
4)	Max. Passengers (No)/Load	
5)	Maximum Rise.	
6)	Nos. of floors served	
7)	Speed (m/s)	
8)	Driving mechanism.	
9)	Traction Motor	
	a) Type	
	b) Rating (HP)	
	c) Voltage (V)	
	d) Starting Current under full load	
	e) Running Current	
	f) Speed (R.P.M.)	
	g) Insulation Class	
	h) Max. starting torque (Kg.f.m.)	
	i) Temperature rise at full Load °C.	
10)	Roping	

a) Number and Construction of ropes
b) Size
c) Roping ratio
d) Factor of safety
e) Material

11) Guide rail size

12) Stainless steel cars.

a) Construction details
b) Illumination
c) Dead weight of car (Kgs)
d) Dimensions
e) Thickness of sheet steel for car
f) Operating device in car doors.

13) Counter weight (Kg)

14) Governor trip (% rated speed)

15) Buffer type

16) Sheaves

17) Details of car lighting

18) Details of car ventilation

19) Pit depth from bottom landing as per drawing enclosed.

20) Clearance between Top landing and Top slab.

21) Machine Room dimensions and layout.

22) Enclosure and degree of protection for electrical equipment.

23) Cable size for power requirement

24) Make / Country of origin for V3F module.
25) Or the items if not mentioned in the table.

Section 7: Draft Contract Agreement

RFP for Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida.

THIS AGREEMENT made on the …….. day of …….. 2022 at Noida, District Gautam Budh Nagar, Uttar Pradesh Between **Noida Metro Rail Corporation Limited** (Hereafter referred to as "NMRC"), a company incorporated under Companies Act 2013, vide corporate identification Number: U60231UP2014SGC066849 and having its registered office at **Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29, Noida -201301, District Gautam Budh Nagar, Uttar Pradesh, India** *represented by …….. of the company, by virtue of his designation and authorization by* ***……, Managing Director, NMRC*** (hereinafter called as the "Employer"), which expression shall unless excluded by or repugnant to the context or meaning thereof be deemed to include its successors and permitted assigns) of the one part,

AND

…….. having its registered office at **……**, represented by **……** (herein after called the **"Contractor",** which expression shall unless excluded by or repugnant to the context or meaning thereof be deemed to include its successors and permitted assigns) of the other part. WHEREAS the Employer desires that the Works known as the **"……."** should be executed by the Contractor and has accepted a contract by the Contractor for the execution and completion of these Works.

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement -

Reference:

(i) Tender No. …… Dated ……..
(ii) Bid Documents duly accepted and submitted by …… dated ……..
(iii) The Bidding Documents which include all the Sections specified below:
   a. Section 1: General Information
   b. Section 2: Terms of Reference
   c. Section 3: Instructions to Bidders
   d. Section 4: Qualification, Evaluation and Selection Process
   e. Section 5: Special Conditions of Contract
   f. Section 6: Technical Specifications
   g. Section 7: Draft Contract Agreement
   h. Section 8: Appendix and Forms
   i. General Conditions of Contract (GCC)
   j. Amendment/ Modification, if any

(iv) Notice of Award (…….) issued by NMRC.
(v) Letter of Acceptance of NOA (…….) given by …….. to NMRC. And it will be treated as start of work.
(vi) Any other admitted correspondence documents between NMRC and the Bidder.

3. **Duration of Contract**
   The Corporation intends to appoint a Contractor to NMRC for a period of 4 (Four Months).

4. **Price Schedule**
   NMRC shall consider the following Total Contract Price, as quoted by the Contractor as part of financial bid**.**

5. The courts at District Gautam Budh Nagar, Uttar Pradesh shall have the exclusive jurisdiction to try all disputes arising out of this agreement between the parties.

6. In consideration of the payments to be made by the Employer to the Contractor as specified in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract and Notice of Award issued. "**Any conditions, deviation, assumption, exclusion, suggestion of alternative clauses, request of amendments in conditions & specifications of work submitted by bidders along with his Technical Bid or Financial bid, which is different from the Tender Document, Corrigendum, Addendum uploaded by NMRC on the E-Tender Portal (http://etender.up.nic.in) or www.nmrcnoida.com and any other correspondence in this regard, shall not be treated as a part of the contract Agreement & shall not be binding upon NMRC in anyway whatsoever at any stage of work during execution or thereafter."**

7. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract and NOA.

IN WITNESS where of the parties hereto have caused this Agreement to be executed in accordance with the laws of India on the day, month and year specified above.

For and on behalf of the Contractor Signature of the authorized official	For and on behalf of the Employer Signature of the authorized official
Name of the official	**Name of the official**
Stamp/Seal of the contractor	Stamp/Seal of the Employer
In the presence of:	In the presence of:
Sign of Witness 1_____	Sign of Witness 1_____
Name_____	Name_____
Address_____	Address_____
_____	_____

Sign of Witness 2_____

Name_____

Address_____

_____

Sign of Witness 2_____

Name_____

Address_____

_____

7. Section 8: Appendix and Forms of Tender

7.1. Appendix 1: Metro Alignment

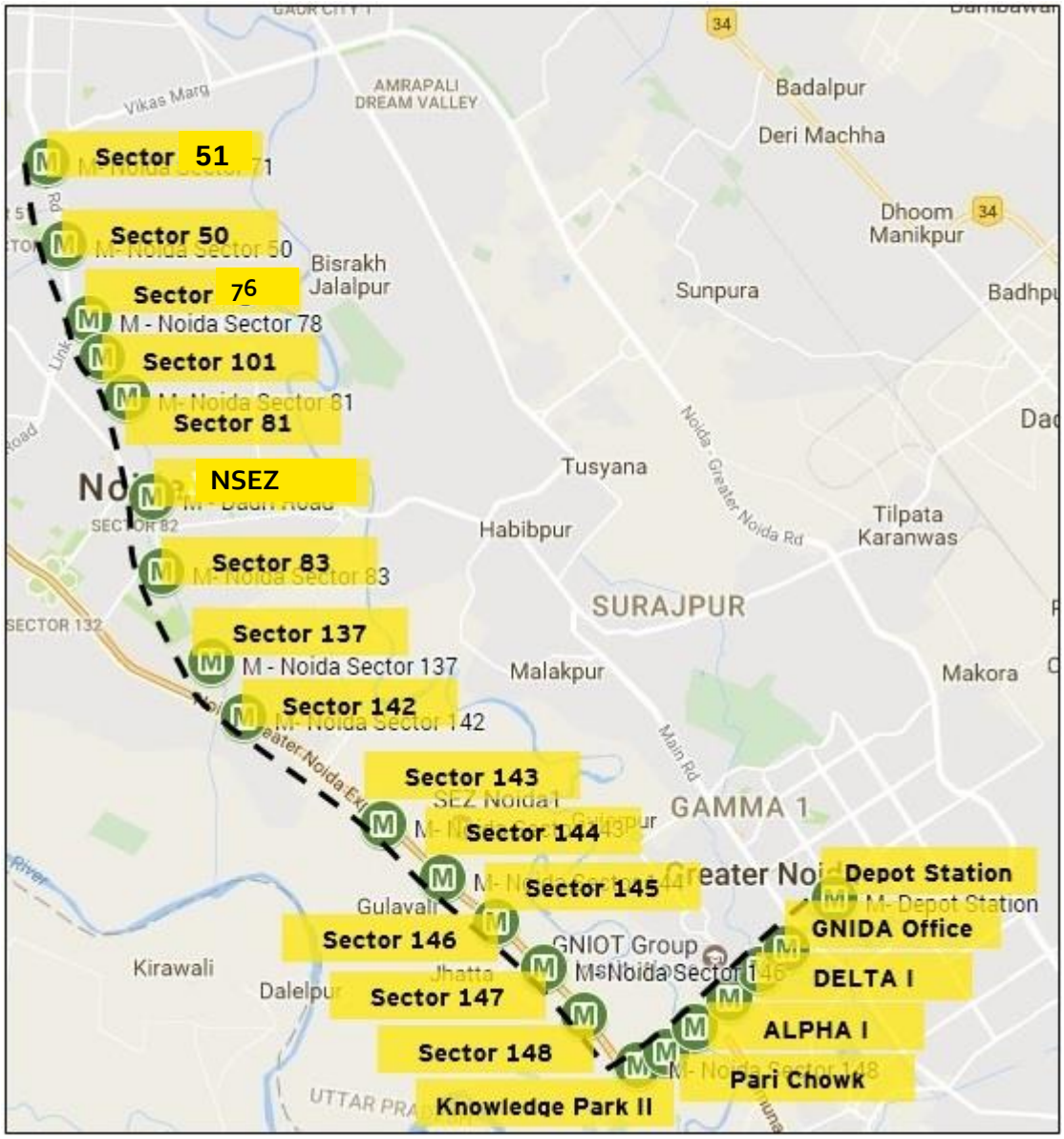

Fig: The Upcoming Metro Line

Please Note: The map shown above is indicative (not to scale)

7.2. Appendix 2: Quality Assurance

The Contractor shall implement a Project Quality Management Plan in accordance with ISO9001 "Quality System - Model for Quality Assurance in Design/Development, Production, Installation and Servicing" to ensure that all materials, workmanship, plant and equipment supplied, and work done under the contract meets the requirements of the contract. This plan shall apply to all activities related to the quality of items, including designing, purchasing, inspecting, handling, assembling, testing, storing, and shipping of materials and equipment and different elements of maintenance work and installations of system components.

The Quality Plan to be prepared by the Contractor and submitted to the Engineer shall follow the requirements of ISO 9000 and address each element therein.

Registration of the Contractor's organisation, or subcontractors or sub-consultants is not required for this Project, but the Project Quality Management Plan as submitted shall meet the intent of the ISO 9000 requirement in that there is a comprehensive and documented approach to achieving the project quality requirements.

Quality Assurance Management Plan

The Project Quality Management Plan (PQMP) shall as a minimum address the quality system elements as required by ISO 9001, generally noting the applicability to the Contractor's Works Programme for the Project. Procedures or Quality Plans to be prepared by others (Suppliers, Subcontractors, and Sub-consultants) and their incorporation in the overall PQMP shall be identified.

The Contractor shall provide and maintain a Quality Assurance Plan (QA) to regulate methods, procedures, and processes to ensure compliance with the Contract requirements. The QA Plan, including QA written procedures, shall be submitted to the Engineer for his review.

Adequate records shall be maintained in a readily retrievable manner to provide documented evidence of quality monitoring and accountability. These records shall be available to Employer at all times during the term of the Contract and during the Defects Liability Period and for a five-year period thereafter.

The Plan shall identify:

a. Design Process: that control, check and verify the accuracy, completeness and integration of the design shall be performed by certified personnel and in accordance with documented procedure that have the written consent of the Engineer.

b. Special Processes: that control or verify quality shall be performed by certified personnel and in accordance with documented procedures that have the written consent of the Engineer;

c. Inspection and Test: Inspection and testing instructions shall provide for reporting non conformance's or questionable conditions to the Engineer; Inspection shall occur at appropriate points in the installation sequence to ensure compliance with drawings, test specifications, process specifications, and quality standards. The Engineer shall designate, if necessary, inspection hold points into installation or inspection planning procedures;

d. Receiving Inspection: These procedures shall be used to preclude the use of nonconforming materials and to ensure that only correct and accepted items are used and installed;

e. Identification and Inspection Status: a system for identifying the progressive inspection status of equipment, materials, components, subassemblies, and assemblies as to their acceptance, rejection, or non-inspection shall be maintained;

f. Identification and Control of Items: an item identification and traceability control shall be provided;

g. Handling, Storage, and Delivery: provide for adequate work, surveillance and inspection instructions.

h. The Plan shall ensure that conditions adverse to quality such as failures, malfunctions, deficiencies, deviations, and defects in materials and equipment shall be promptly identified and corrected.

i. The Plan shall provide for establishing and maintaining an effective and positive system for controlling non-conforming material including procedures for the identification, segregation, and disposal of all non-conforming material. Dispositions for the use or repair of nonconforming materials shall require the Engineers consent.

Plan Implementation and Verification

The Plan shall clearly define the QA Organisation. Management responsibility for the QA shall be set forth on the Contractor's policy and organisation chart. The Plan shall define the requirements for QA personnel, their skills and training. Records of personnel certifications shall be maintained and monitored by the QA personnel. These records shall be made available to the Engineer for review, upon request.

The QA operations shall be subject to the Engineers, Employer or Employer's authorised representative's verification at any time, including: surveillance of the operations to determine that practices, methods and procedures of the plan are being properly applied; inspection to measure quality of items to be offered for acceptance; and audits to ensure compliance with the Contract documents.

The contractor's Quality Audit Schedule shall be submitted to the Engineer for consent weekly or more frequently as required.

The results of Quality Audits shall be summarized in the Contractor's weekly reports.

The Contractor shall provide all necessary access, assistance and facilities to enable the Engineer to carry out on-site and off-site surveillance of Quality Assurance Audits to verify that the quality system which has the consent of the Engineer is being implemented fully and properly.

7.3. Form 1: Letter of Proposal Submission

[Location, Date]

To

DGM (RS, Ops & Elect.)
Noida Metro Rail Corporation (NMRC) Limited
Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29,
Noida - 201301
District Gautam Budh Nagar, Uttar Pradesh

Subject: RFP for Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida.

Dear Sir,

We, the undersigned, offer to **Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida.** in accordance with your RFP Document dated …….. and our Proposal. We are hereby submitting our Technical and Financial Proposal, in a sealed envelope. We confirm that we have read the RFP Document in totality and abide by the terms and conditions stated in the document.

We acknowledge that we have

- Studied and analysed and satisfied ourselves about all the requirement of the tender including but not limited to market and market conditions
- Carefully assessed the commerciality of Project and that we will be fully responsible for all its assessment in this regard.
- Seen / visited / assessed the potential locations and fully understand and comprehend the technical, financial, commercial and investment requirements.

We have filled the complete information correctly in **Form 19.**

We hereby declare that all the information and statements made in this Proposal are true and accept that any misinterpretation contained in it may lead to our disqualification. Our Proposal is binding upon us.

We understand you are not bound to accept any Bid you receive.

_____

Yours Sincerely,

Authorized Signature [In full and initials]:

Name and Title of Signatory:

Name and address of Firm:

7.4. Form 2: Firm Details

1.	**Title and name of the Project:** **Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida..**
2.	State the structure of the Bidder's organization (Bidders to complete/delete as appropriate) Sole Bidder/Consortium
3.	For Bidders who are individual companies or firms, state the following: Name of Company or firm: …… Legal status: (e.g. incorporated private company, proprietorship, etc.) …… Registered address: ……..…… Year of incorporation…….…… Principal place of business: ……. Contact person: …….. Contact person's title: …… Address, telephone, facsimile number and e-mail ID of contact person: …… …… ……...
4.	JV not allowed
5.	Employees Provident Fund No. (attach documentary proof) -
6.	Employees State Insurance Acts in India No. (attach documentary proof) -
7.	GST Registration No. (attach documentary proof) -
8.	PAN (attach documentary proof) -

7.5. Form 3: Capability Statement

It is Compulsory for the bidder to fill this statement and the bidder must upload those document that support this statement

Tender Reference No : _____

Name of Work: _____

Name of Bidder: _____

S.No.	**ELIGIBILITY CRITERIA**		**(To be filled by the Bidder)**
1	Sole proprietorship, registered partnership firm, public limited company, private limited company of any of the above can submit the Bidder. The firms and the companies should be registered in India.	Yes/ No	
2	The Bidder should have a minimum experience of having satisfactorily completed similar works during last 7 (seven) years period ending last day of month before the one in which the bids are invited should be either of the following: i. One similar completed work costing not less than the amount equal to **Rs. 27 Lakh** (Rupees Twenty Seven Lacs only) or ii. Two similar completed works each costing not less than the amount equal to **Rs. 17.00 Lakh** (Rupees Seventeen Lacs only) or iii. Three similar completed works each costing not less than the amount equal to **Rs. 14.00 Lakh** (Rupees Fourteen Lacs only)	7 Years	

<table>
<tr><th><u>S.No.</u></th><th><u>ELIGIBILITY CRITERIA</u></th><th>(To be filled by the Bidder)</th></tr>
<tr><td>3</td><td>The Bidder should have minimum average annual turnover of Rs. 32.53 Lakh (Rupees Twenty Seven Lacs only) in the last 3 (three) Financial Years (2018-19, 2019-20, 2020-21) preceding the Bid Due Date.

<table><tr><td>FY 18-19</td><td></td></tr><tr><td>FY 19-20</td><td></td></tr><tr><td>FY 20-21</td><td></td></tr><tr><td>Total</td><td></td></tr></table><u>Average Turnover</u></td><td></td></tr>
<tr><td>6</td><td>The Bidder should have Positive Profit before Tax in at least 3 (three) years, Financial Years (2018-19, 2019-20, 2020-21)</td><td></td></tr>
<tr><td>7</td><td>The Bidder must have either the Registered Office or the functional Branch Office located in Delhi NCR.</td><td></td></tr>
<tr><td>8</td><td>The Bidder should be registered with the Goods and Services Tax Authorities.</td><td></td></tr>
<tr><td>9</td><td>The Bidder should not have been blacklisted/ banned/ declared ineligible for corrupt and fraudulent practices by the Government of India/ any State Government/ Government Agency and Supreme court and contracts have been terminated/ foreclosed by any company / department due to non-fulfilment of Contractual obligation in last 5 (five) financial years.</td><td></td></tr>
</table>

7.6. Form 4: Work Experience

The following format shall be used for statement of experience of Bidder:

SN	Similar Contract description	Contract Identification Number	Award date & Completion date	Employer's Name, address, telephone number, e-mail etc	Role in contract		If in Consortium then % participation	Completion cost	Value of similar work in completed work
					Individual	Consortium			
1									
2									
3									
4									
	Add required number of rows								

Authorized signatory

Name:

Date:

Name of the Bidder with seal

NOTE:

1. Only the value of contract as executed by the applicant/member in his own name should be indicated. Where a work is undertaken by a group, only that portion of the contract which is undertaken by the concerned applicant/member should be indicated and the remaining done by the other members of the group be excluded. This is to be substantiated with documentary evidence
2. The Bidder shall upload details of work executed by them in the prescribed format for the works to be considered for qualification of work experience criteria. Documentary proof such as completion certificates from the client clearly indicating the nature/scope of work, actual completion cost and actual date of completion for such work should be uploaded. In case work is executed for private client documentary proof such as copy of work order, Bill of quantities, Bill wise details of payment received certified by CA, TDS certificates for all the payments received, copy of final/ last bill paid by the client should be uploaded. The offers submitted without this documentary proof will not be evaluated.
3. Value of successfully completed portion of any ongoing work up to the last day of the previous month of tender submission will also be considered for qualification of work experience criteria.
4. For completed works, value of work done shall be updated to the last day of the previous month of tender submission 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 tender.
5. If the above work(s) comprise(s) other works also, then client's certificate clearly indicating the amount of work done in respect of the "similar work" shall be furnished by the Bidder in support of work experience along-with their tender submissions.

7.7. Form 5: Financial Capability Details

Bidder should submit their financial details as per the following:

This is to certify that the details of M/s ……

having registered office at ……

…….., as applicable, is as below:

A.

S.No.	Financial year	Name of the Bidder	Turnover from Similar Work
1.	FY 18-19		
2.	FY 19-20		
3.	FY 20-21		
	Average Annual Turnover		

B.

S.No.	Financial year	Name of the Bidder	Profitability
1.	FY 18-19		
2.	FY 19-20		
3.	FY 20-21		
	Average Annual Turnover		

Certificate of the Chartered Accountants/Statutory Auditors

Based on Audited Accounts and other relevant documents of_____ (Name of Bidder), we M/s _____, Chartered Accountants/ Statutory Auditors, certify that the above information pertaining to **(2018-19, 2019-20, 2020-21)** is correct.

Signature and Seal of
Chartered Accountants/Statutory Auditors
(with membership no. & UIDN No.)
Authorised Signatory

(Name & Designation of Authorised Signatory)

In case the Financial Statements for the latest financial year are not audited and therefore the Bidder cannot make it available, the Bidder shall give an undertaking to this effect and the statutory auditor/charted accountant shall certify the same. In such a case, the Bidder shall provide the Audited Financial Statements for 2 (two) years preceding the year for which the Audited Financial Statement is not being provided. Also, pertaining to latest

financial year, the bidder shall submit an affidavit certifying that "The Annual Accounts have not been audited so far which is certified by CA also."

NOTE:

1. All such documents reflect the financial data of the bidder and not that of sister or parent company.
2. The financial data in above prescribed format shall be certified by CA/ Company Auditor under his signature and stamp in original along with membership no.
3. The Bidder shall provide the audited annual financial statements as required.

7.8. Form 6: Memorandum

Name of Work: Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida..

I/We agree to keep the quoted rate open for acceptance for 180 days from the due date of submission thereof and not make any modification in its terms and conditions.

I/We hereby declare that I/We shall treat the quotation documents, drawings and other records connected with the works as secret/ confidential documents and shall not communicate information derived there from to any person other than the information in any manner prejudicial to the safety of NMRC.

_____

Signature of the bidder with seal

Dated:

7.9. Form 7: Undertaking

I confirm that We (Bidder), _____

a. Have not been banned /declared ineligible for corrupt and fraudulent practices by any government/government-undertaking/ semi-government/ govt.-controlled institutions, any court of law having jurisdiction in India for the past 5 (five) years.

b. Do not have any pending litigation & non-performing contracts during last 5 (five) years. Further, has not been barred by any government/government-undertaking/ semi-government/ govt.-controlled institutions

c. Have not abandoned any work in last 5 (five) years.

d. Have not delayed in similar work completion during orders executed in last 5 (five) years.

e. Do not ever been terminated due to poor performance.

f. Have not suffered Bankruptcy/ insolvency in last 5 (five) years.

g. Have not been blacklisted/debarred by any organization.

h. Have not been be involved in any illegal activity and/or has not been charge sheeted for any criminal act during the last 5 (five) years.

i. Have not submitted any misleading information in the Bid.

j. Are financially sound to perform the work.

Authorized signatory

Name:

Date:

Name of the Bidder with seal

7.10. Form 8: Power of Attorney

(To be on non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution.)
Power of Attorney to be provided by the Bidding Company in favour of its representative as evidence of authorized signatory's authority.

Know all men by these presents, We ……(name and address of the registered office of the Bidding Company) do hereby constitute, appoint and authorize Mr./Ms……(name and residential address) who is presently employed with us and holding the position of _____, as our Attorney to do in our name and our behalf all or any of the acts, deeds or things necessary or incidental to submission of our Bid for **Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida.** in response to the RFP Document dated _____ issued by Noida Metro Rail Corporation ("NMRC" or "the Corporation"), including signing and submission of the Bid and all other documents related to the Bid, including but not limited to undertakings, letters, certificates, acceptances, clarifications, guarantees or any other document which the Corporation may require us to submit. The aforesaid Attorney is further authorized for making representations to the NMRC or any other authority, and providing information / responses to the NMRC, representing us in all matters before the NMRC, and generally dealing with the Corporation in all matters in connection with our Bid till the completion of the bidding process as per the terms of the RFP Document and further till the Contract is entered into with the NMRC and thereafter till the expiry of the Contract.

We hereby agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall be binding on us and shall always be deemed to have been done by us.

All the terms used herein but not defined shall have the meaning ascribed to such terms under the RFP Document.

Signed by the within named
..... [Insert the name of the executant company]
through the hand of
Mr. ……
duly authorized by the Board to issue such Power of Attorney
Dated this ……. day of ……

Accepted
……
Signature of Attorney
(Name, designation and address of the Attorney)

Attested
……
(Signature of the executant)
(Name, designation and address of the executant)

……
Signature and stamp of Notary of the place of execution

Common seal of …… has been affixed in my/our presence pursuant to Board of Director's Resolution dated……
WITNESS
1. ……

(Signature)
Name ……

Designation.....……..

2. …….
(Signature)
Name ……

Designation.....……..

Notes:

(1) 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 the same should be under common seal of the executant affixed in accordance with the applicable procedure. Further, the person whose signatures are to be provided on the power of attorney shall be duly authorized by the executant(s) in this regard.

(2) In the event, power of attorney has been executed outside India, the same needs to be duly notarized by a notary public of the jurisdiction where it is executed.

(3) Also, wherever required, the executant(s) should submit for verification the extract of the charter documents and documents such as a board resolution / power of attorney, in favour of the person executing this power of attorney for delegation of power hereunder on behalf of the executant(s).

7.11. Form 11: Saleable Form for Tender Document

Job No. ……..

The required fee of tender form has been deposited in _____ Bank A/c No. _____ RTGS/NEFT and the scanned copy of UTR receipt with Transaction Id is being enclosed with E-tender documents. If the copy of UTR receipt is not uploaded with the E-tender the tender shall be rejected.

DETAILS OF EARNEST MONEY ATTACHED

The required amount of Earnest money has been deposited in _____ Bank A/c No. _____ RTGS/NEFT and the scanned copy of UTR receipt with transaction Id is being enclosed with E-tender documents. If the copy of UTR receipt is not uploaded with the E-tender the tender shall be rejected.

Signature of BIDDER

7.12. Form 12: Declaration of Refund of Earnest Money

Noida Metro Rail Corporation (NMRC) Limited
Block-III, 3rd Floor,
Ganga Shopping Complex, Sector-29, Noida -201301,
District Gautam Budh Nagar, Uttar Pradesh, India

1	**Bidder Name**	
2	**Bidder Address**	
3	**Bank Name**	
4	**Bank Branch**	
5	**A/c No**	
6	**IFSC Code**	
7	**PAN No.**	
8	**Tin/TAN No.**	
9	**GST No.**	
10	**Phone No.**	
11	**Mobile No.**	
12	**Email-Id**	
13	**Type of Account**	

For Office Use Only

14	**Party Unique Id**	

The above provided information is true to the best of my knowledge.

Date: **Signature with Stamp/Seal**

7.13. Form 13: Undertaking pertaining to Personnel

- We confirm to deploy Project Personnel required to achieve progress of work as per approved construction of work program and conditions mentioned in the tender document.

- We confirm to deploy man power requirement of SHE Organization as required under Conditions of contract on Safety and Health for electrical works and confirm to deploy man power over and above the minimum numbers, if the work requires.

- The contractor shall deploy resources as per the mentioned minimum requirement in the tender and confirm to deploy manpower over and above the minimum numbers indicated above, if the work requires so.

- These minimum resources are as per the requirements of the various activities at different stages of works. All resources need not to be mobilised simultaneously, resources as per the requirement of various stages of works shall be mobilised in accordance with the instructions of the Engineer. The decision of the Engineer shall be final and bonding.

- The performance of project personal deployed will be evaluated periodically by Employer during the contract period. In case the performance of any of the personnel is not satisfactory, the contractor shall replace them with good personnel immediately as per the directions of the Engineer.

Date: **Signature with Stamp/Seal**

7.14. Form 14: Resources proposed for the O&M - Plant & Equipment

1. We hereby confirm to deploy the minimum resources as per mentioned minimum requirement in the tender document.

2. We confirm to deploy resources as per the requirement and also confirm to deploy plants & equipments over and above the minimum numbers, if the work requires so.

3. Hiring of Cranes shall be as per approved by Engineer-in-Charge. Third party certification of cranes, competency certification of the operators etc. would be required before grant of approval.

Date: **Signature with Stamp/Seal**

7.15. Form 15: Proposed Personnel

Affix self-attested photograph

NAME : ……

FATHER'S NAME :……..

DATE OF BIRTH :……..

PERMANENT ADDRESS : ……..

……

RESIDENTIAL ADDRESS : ……..

……

MARITAL STATUS :……...

EDUCATIONAL QUALIFICATION :……

TECHNICAL QUALIFICATION :……

EXPERIENCE : ……

LANGUAGE KNOWN :……

NATIONALITY : ……..…..

CATEGORY :……

DATE: ……...

PLACE: ……

SIGNATURE

(To be filled by contractor)

Attested by authorised person:

Note: A staffing schedule containing the names, qualifications, professional experience and corporate affiliation of all proposed management personnel (above the level of shift supervisor) and specialists for this work. The submission shall include a provisional management structure and organisation chart showing areas of responsibility, relative seniorities and lines of reporting. The proposed staffing plan shall be in conformity with the "Clause 4.3 – Personnel" of tender document

7.16. Form 16: Obligation/ Compliance to be ensured by Contractor

Sl. No.	Items	Compliance of Contractor (To be filled by contractor)	
		Yes	No
1	License for employing contract labour		
2	Compliance of minimum wages Act by payment of wage on 7th of every month through Bank or in the presence of nominated representative of employer (NMRC Supervisor/manager)		
3 (a)	Compliance of provision of ESI & EPF Act		
3 (b)	Ensure treatment in ESI hospital in case of accident/injuries suffered in performance of work and compensation under ESI Act.		
4	Send Accident report to Regional Labour Commissioner (RLC) & ESI authorities.		
5	Observance of working hours, weekly rest and overtime payments as per minimum wages Act-1948.		

Note: - A Non- filling or "No" by contractor will lead to non-eligibility for contractor in further tendering process.

S.N	Description	Reference Clause	Requirement
i	Latest "date for commencement" of the Works	Clause 8.1 of the GCC	Date given in NOA or Employer's Notice to Proceed
ii	Liquidated Damages	Clause 8.5 of the GCC	(i) 0.015% of contract price per day of delay in completion of whole work. (ii)Total maximum limit of LD including sums payable by the employer to designated contractors is 15% as mentioned in GCC.
iii	Insurance for workers/ employees	Clause 15.4 of the GCC	All the contractor's employees shall have to be covered under ESI and ECA as per Special conditions of contract.
iv	Insurance cover for Contractor's All Risk and other requirements as specified in the GCC	Clause 15 of the GCC	**100%** of the Total Contract Price.
v	Amount of Third-Party Insurance	Clause 15.3 of the GCC	INR 0.75 Million for any one incident, with no. of incidents unlimited.
vi	Period in which all insurances have to be effected	Clause 15.5 of the GCC	Within 1 week from the "date of commencement"

Signature of authorized signatory of Bidder

7.17. Form 17: Performa for Clarifications / Amendments on the RFP

Sl. No.	Document	Clause No. and Existing Provision	Clarification required	Suggested Text for the Amendment	Rationale for the Clarification or Amendment

Authorized signatory

Name:

Date:

Name of the Bidder with seal

7.18. Form 18: Bid Offer/ BOQ (Format)

To

DGM (RS, Ops & Elect)
Noida Metro Rail Corporation (NMRC) Limited
Block-III, 3rd Floor, Ganga Shopping Complex
Noida -201301,
District Gautam Budh Nagar, Uttar Pradesh

THIS FORM IS NOT TO BE FILLED. THE BIDDERS ARE REQUIRED TO FILL THE FINANCIAL PROPOSAL IN XLS FORMAT AFTER DOWNLOADING THE FORM FROM THE E-PROCUREMENT WEBSITE FOR THIS TENDER DOCUMENT

Sub: Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida.

Dear Sir,

I/we have read and examined the RFP document, general terms and conditions.

I/we hereby quote for the Total Price for Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida..

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Price Schedule

(It is to be noted that BOQ corresponds to Section-6 Technical Specifications of Tender Document)

(This BOQ template must not be modified/ replaced by the bidder and the same should be uploaded after filling the relevant columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)

Name of Work: Supply, installation, testing and commisiiong of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida.

S.No	Description of Items	Unit	Rate (Rs)	Qty	Amount (Rs)
1	Providing and laying flamed finish Granite stone flooring in required design and patterns, in linear as well as curvilinear portions of the building all complete as per the architectural drawings with 18 mm thick stone slab over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with cement slurry and pointing with white cement slurry admixed with pigment of matching shade including rubbing, curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge :				
	Polished Granite stone slab jet Black, Cherry Red, Elite Brown, Cat Eye or equivalent. (In Flooring, Skirting and Dedo)	sqm	2589.90	50.00	129495.00
2	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade				
	Two or more coats on new work	sqm	131.45	1000.00	131450.00
3	Providing and fixing 12 mm thick frameless toughened glass door shutter of approved brand and manufacture, including providing and fixing top & bottom pivot & spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc.to be paid separately).	sqm	5882.15	20.00	117643.00

4	Providing and fixing double action hydraulic floor spring of approved brand and manufacture conforming to IS : 6315, having brand logo embossed on the body / plate with double spring mechanism and door weight upto 125 kg., for doors, including cost of cutting floors , embedding in floors as required and making good the same matching to the existing floor finishing and cover plates with brass pivot and single piece M.S. sheet outer box with slide plate etc. complete as per the direction of Engineer-in-charge.With stainless steel cover plate minimum 1.25 mm thickness.	each	2448.85	6.00	14693.10
5	Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories & stainless steel dash fasteners , stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-in-charge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.).	kg	612.25	50.00	30612.50
6	Providing and applying fibre reinforced lastomeric liquid water proofing membrane with resilient acrylic polymers having Sun Reflectivity Index (SRI) of 105 on top of concrete roof in three coats @10.76 litre/ 10 sqm. One coat of self-priming of elastomeric waterproofing liquid (dilution with water in the ratio of 3:1) and two coats of undiluted elastomeric waterproofing liquid (dry film thickness of complete application/system not less than 500 microns). The operation shall be carried out after scrapping and properly cleaning the surface to remove loose particles with wire brushes, complete in all respect as per the direction of Engineer-in-Charge.	sqm	474.15	200.00	94830.00

7	Providing and fixing Ist quality ceramic glazed wall tiles conforming to IS: 15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades except burgundy, bottle green, black of any size as approved by Engineerin- Charge, in skirting, risers of steps and dados, over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.	sqm	1063.45	200.00	212690.00
8	Providing and supplying aluminium extruded tubular and other aluminium sections as per the architectural drawings and approved shop drawings , the aluminium quality as per grade 6063 T5 or T6 as per BS 1474,including super durable powder coating of 60-80 microns conforming to AAMA 2604 of required colour and shade as approved by the Engineer-in-Charge. (The item includes cost of material such as cleats, sleeves, screws etc. necessary for fabrication of extruded aluminium frame work. Nothing extra shall be paid on this account).	kg	370.45	50.00	18522.50
9	Designing, fabricating, testing, installing and fixing in position Curtain Wall with Aluminium Composite Panel Cladding, with open grooves for linear as well as curvilinear portions of the building , for all heights and all levels etc. including:				
	(a) Structural analysis & design and preparation of shop drawings for pressure equalisation or rain screen principle as required, proper drainage of water to make it watertight including checking of all the structural and functional design.				
	(b) Providing, fabricating and supplying and fixing panels of aluminium composite panel cladding in pan shape in metalic colour of approved shades made out of 4mm thick aluminium composite panel material consisting of 3mm thick FR grade mineral core sandwiched between two Aluminium sheets (each 0.5mm thick). The aluminium composite panel cladding sheet shall be coil coated, with Kynar 500 based PVDF / Lumiflon based fluoropolymer resin coating of approved colour and shade on face # 1 and polymer (Service) coating on face # 2 as specified using stainless steel screws, nuts, bolts, washers, cleats, weather silicone sealant, backer rods etc.				

	(c) The fastening brackets of Aluminium alloy 6005 T5 / MS with Hot Dip Galvanised with serrations and serrated washers to arrest the wind load movement, fasteners, SS 316 Pins and anchor bolts of approved make in SS 316, Nylon separators to prevent bi-metallic contacts all complete required to perform as per specification and drawing The item includes cost of all material & labour component, the cost of all mock ups at site, cost of all samples of the individual components for testing in an approved laboratory, field tests on the assembled working curtain wall with aluminium composite panel cladding, cleaning and protection of the curtain wall with aluminium composite panel cladding till the handing over of the building for occupation. Base frame work for ACP cladding is payable under the relevant aluminium item.s The Contractor shall provide curtain wall with aluminium composite panel cladding, having all the performance characteristics all complete , as per the Architectural drawings, as per item description, as specified, as per the approved shop drawings and as directed by the Engineer-in-Charge. However, for the purpose of payment, only the actual area on the external face of the curtain wall with Aluminum Composite Panel Cladding (including width of groove) shall be measured in sqm. up to two decimal places."	Sqm	4474.20	15.00	67113.00
10	Providing, assembling and supplying vision glass panels (IGUs) comprising of hermetically-sealed 6-12- 6 mm insulated glass (double glazed) vision panel units of size and shape as required and specified, comprising of an outer heat strengthened float glass 6mm thick, of approved colour and shade with reflective soft coating on surface # 2 of approved colour and shade, an inner Heat strengthned clear float glass 6mm thick, spacer tube 12mm wide, dessicants, including primary seal and secondary seal (structural silicone sealant) etc. all complete for the required performances, as per the Architectural drawings, as per the approved shop drawings, as specified and as directed by the Engineer-in-Charge. The IGUs shall be assembled in the factory/ workshop of the glass processor.“(Payment for fixing of IGU Panels in the curtain glazing is included in cost of item No.26.2)“For payment, only the actual area of glass on face # 1 of the glass panels (excluding the areas of the grooves and weather silicone sealant) provided and fixed in position, shall be measured in sqm.“				

	(i) Coloured tinted float glass 6mm thick substrate with reflective soft coating on face # 2, + 12mm Airgap + 6mm Heat Strengthened clear Glass of approved make having properties as visible Light transmittance (VLT) of 25 to 35 %, Light reflection internal 10 to 15%, light reflection external 10 to 20 %, shading coefficient (0.25- 0.28) and U value of 3.0 to 3.3 W/m2 degree K etc. The properties of performance glass shall be decided by technical sanctioning authority as per the site requirement.	Sqm	3377.50	3.00	10132.50
11	Designing, fabricating, testing, protection, installing and fixing in position semi (grid) unitized system of **structural glazing** (with open joints) for linear as well as curvilinear portions of the building for all heights and all levels, including:				
	(a) Structural analysis & design and preparation of shop drawings for the specified design loads conforming to IS 875 part III (the system must passed the proof test at 1.5 times design wind pressure without any failure), including functional design of the aluminum sections for fixing glazing panels of various thicknesses, aluminium cleats, sleeves and splice plates etc. gaskets, screws, toggles, nuts, bolts, clamps etc., structural and weather silicone sealants, flashings, fire stop (barrier)- cum-smoke seals, microwave cured EPDM gaskets for water tightness, pressure equalisation & drainage and protection against fire hazard including:				
	(b) Fabricating and supplying serrated M.S. hot dip galvanised / Aluminium alloy of 6005 T5 brackets of required sizes, sections and profiles etc. to accommodate 3 Dimentional movement for achieving perfect verticality and fixing structural glazing system rigidly to the RCC/ masonry/structural steel framework of building structure using stainless steel anchor fasteners/ bolts, nylon seperator to prevent bimetallic contacts with nuts and washers etc. of stainless steel grade 316, of the required capacity and in required numbers.				

	(c) Providing and filling, two part pump filled, structural silicone sealant and one part weather silicone sealant compatible with the structural silicone sealant of required bite size in a clean and controlled factory / work shop environment , including double sided spacer tape, setting blocks and backer rod, all of approved grade, brand and manufacture, as per the approved sealant design, within and all around the perimeter for holding glass.				
	(d) Providing and fixing in position flashings of solid aluminium sheet 1 mm thick and of sizes, shapes and profiles, as required as per the site conditions, to seal the gap between the building structure and all its interfaces with curtain glazing to make it watertight.				
	(e) Making provision for drainage of moisture/ water that enters the curtain glazing system to make it watertight, by incorporating principles of pressure equalization, providing suitable gutter profiles at bottom (if required), making necessary holes of required sizes and of required numbers etc. complete. This item includes cost of all inputs of designing, labour for fabricating and installation of aluminium grid, installation of glazed units, T&P, scaffolding and other incidental charges including wastages etc., enabling temporary structures and services, cranes or cradles etc. as described above and as specified. The item includes the cost of getting all the structural and functional design including shop drawings checked by a structural designer, dully approved by Engineer-in-charge. The item also includes the cost of all mock ups at site, cost of all samples of the individual components for testing in an approved laboratory, field tests on the assembled working structural glazing as specified, cleaning and protection till the handing over of the building for occupation. In the end, the Contractor shall provide a water tight structural glazing having all the performance characteristics etc. all complete as required, as per the Architectural drawings, as per item description, as specified, as per the approved shop drawings and as directed by the Engineer- in-Charge.				
	Note:- 1. The cost of providing extruded aluminium frames, shadow boxes, extruded aluminium section capping for fixing in the grooves of the curtain glazing and vermin proof stainless steel wire mesh shall be paid for separately under relevant items under this sub- head. However, for the purpose of payment, only the actual area of structural glazing (including width of grooves) on the external face shall be measured in sqm. up to two decimal places.				

	Note:- 2. The following performance test are to be conducted on structural glazing system if area of structural glazing exceeds 2500 Sqm from the certified laboratories accreditated by NABL(National Accreditation Board for Testing and Calibration Laboratories), Department of Science & Technologies, India. Cost of testing is payable separately. The NIT approving authority will decide the necessity of testing on the basis of cost of the work, cost of the test and importance of the work. Performance Testing of Structural glazing system Tests to be conducted in the NBL Certified laboratories				
	(1) Performance Laboratory Test for Air Leakage Test (-50pa to - 300pa) & (+50pa to +300pa) as per ASTM E-283-04 testing method for a range of testing limit 1 to 200 mVhr				
	(2) Static Water Penetration Test. (50pa to 1500pa) as per ASTME- 331-09 testing method for a range up to 2000 ml.				
	(3) Dynamic Water Penetration (50pa to 1500pa) as per AAMA 501.01- 05 testing method for a range upto 2000 ml				
	(4) Structural Performance Deflection and deformation by static air pressure test (1.5 times desing wind pressure without any failure) as per ASTME-330-10 testing method for a range upto 50 mm				
	(5) Seismic Movement Test (upto 30 mm) as per AAMA 501.4-09 testing method for Qualitative test. Tests to be conducted on site.				
	(6) Onsite Test for Water Leakage for a pressure range 50 kpa to 240 kpa (35psi) upto 2000 ml	Sqm	3111.35	3.00	9334.05
Total Schedule A (Civil Items)					**836515.65**
	Fire Fighting Work				
	Fire Extinguisher				
1	Providing and fixing fire extinguisher of carbon dioxide type consisting of brand newhigh pressure steel cylinder bearing IS: 7285 mark and having the approval ofcontroller of explosives Nagpur, wheel type valve bearing IS:3224 markinternal discharge tube, 1 meter long high pressure discharge hose, nonconducting horn, suspension bracket, fully charged bearing IS: making fixedto wall as directed conforming IS : 15683 1.1 4.5kgcapacity cylinder	Each	13800.00	4.00	55200.00

	Electrical Work				
	Sub Head-1: Wiring & Submain				
2	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required.				
	Group C	Each	1146.05	5.00	5730.24
3	Wiring for group controlled (looped) light point/fan point/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed PVC conduit, and earthing the point with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable etc. as required. Group C	Each	642.48	5.00	3212.41
4	Erection **and testing of ceiling fan** and regulator etc excluding supply of down rod, complete in all respect.	Each	92.61	1.00	92.61
5	Supply and fixing of power plug with 15A/250 volt flush type switch and 5 pin 15A/250V flush type universal socket in suitable M.S. box of 175mm x 100mm x 50mm size with phenolic laminated bakelite sheet cover 3mm thick fixed with brass machine screw and cup washer.	Each	393.59	4.00	1574.37
6	S/F of **hexagonal fan box** with hexagonal side of approx. 80 mm.in length fabricated from 16 SWG M.S. sheet incorporating with 10 mm. dia. M.S. round bar duly bent for supporting fan hanger duly painted with red oxide and screwing arrangement with wiring conduit laid in the R.C.C. roof before concreting along with supply of all materials, labour, T&P etc. for proper completion of work.	Each	173.64	1.00	173.64
7	Supply & fixing of electronic **Fan regulator**, dimmer, 120-280 V ISI marked, on the existing switch board including making connections, required material, labour T/P etc. for proper completion of work to the satisfaction of Engineer of work.	Each	309.09	1.00	309.09

8	Supply & wiring of **sub main** with two number 6 sq. mm. FR P.V.C. insulated 1100 volts grade single core **copper conductor** cable in 25 mm dia heavy duty(2 mm thick) PVC conduit with one number 4 sq. mm. FR PVC insulated multistranded copper cable as earth continuity wire drawn in conduit partly concealed in wall and patly laid in slab along with reinforcement before concreating.	Metre	236.16	96.00	22670.93
9	Supply fixing and concealing **rigid steel conduit pipe** in the wall including cutting of brick work, laying of conduit and fixing it with M.S. hooks and then plastering with cement, sand motar finished to the level, with matching color wash including cost of proper threading of the conduit and providing necessary sockets, bends and chuck nuts as directed by the engineer-in-charge with supply of all material labour and T&P required for proper completion of work. (for Telephone / Television / circuits)				
10	25 mm dia. conduit (16 SWG) thick	Metre	180.59	20.00	3611.79
11	**Sub Head -II : Distribution Board**				
12	Supply and fixing of 16Amp. 240V SPN metal clad rewireable type switch fuse unit on M.D.F.E.G./Teak wood board complete in all respect.	Each	782.55	1.00	782.55
13	Supply and fixing of 32Amp. 415V TP metal clad rewireable type switch fuse unit on angle iron bracket complete in all respect.	Each	2280.52	1.00	2280.52
14	Supply and fixing surface/flush mounting SPN distribution board(Legrand Lexic) without MCB with additional metal door complete in all respect, as directed at site by Engineer in charge. (CAT A)				
15	8 way SPN	Each	2199.49	2.00	4398.98
16	12 way SPN	Each	2604.66	1.00	2604.66
17	Supply and fixing surface/flush mounting TPN distribution board(Legrand Lexic) without MCB with additional metal door complete in all respect, as directed at site by Engineer in charge.				
18	8 way TPN	Each	5301.92	1.00	5301.92
19	12 way TPN	Each	15790.01	1.00	15790.01

20	S & F of 6Amp. To 32 Amp. SPMCB(10KA)(Legrand Lexic)	Each	300.98	10.00	3009.83
21	Supplying and fixing single pole blanking plate in the existing MCB DB complete etc. as required.	Each	9.26	10.00	92.61
22	Supplying and fixing 40Amp. D.P. isolator)(Legrand Lexic)	Each	526.72	2.00	1053.44
23	Supplying and fixing 40Amp. T.P. isolator)(Legrand Lexic)	Each	891.37	1.00	891.37
24	Supplying and fixing 63Amp. T.P. isolator)(Legrand Lexic)	Each	1030.29	2.00	2060.57
25	Supplying, fixing & making connection of 25A 2 pole 30mA ELCB/RCCB of din rail mounting complete in all respect as per direction and satisfaction to the engineer in charge.	Each	2627.81	1.00	2627.81
26	Supplying, fixing & making connection of 40A 2 pole 30mA ELCB/RCCB of din rail mounting complete in all respect as per direction and satisfaction to the engineer in charge.	Each	2639.39	2.00	5278.77
27	Supplying, fixing & making connection of 63A 2 pole 30mA ELCB/RCCB of din rail mounting complete in all respect as per direction and satisfaction to the engineer in charge.	Each	3414.99	1.00	3414.99
28	S/F of **shock treatment chart** (prescribed under I.E.rules) duly framed with glass and supported from back with hard board or soft board with supply of all material labour T & P etc for proper completion of work.	Each	353.08	4.00	1412.30
29	Supply and laying of 1800 mm x 900 mm x 12 mm thick **chequered rubber matting** of tested quality.	Each	2951.94	1.00	2951.94
30	S/F of **danger board** fabricated from 10 gauge M.S. sheet as per E/I rules.	Each	98.40	4.00	393.59
	Sub Head - IV : Lighting Fixture & Fan				
	Supply, Installation, testing & Comissioning of Lights fixtures shall be complete with LED lamps, control gear & power factor improvement capacitor complete with all required accessories.Samples of all the fixtures with all available colour shall be submitted to the architect/ client/ Project Manager before supply & approval is taken.Please check the fixtures final quantity from the Architect / Project Manager before ordering and be sure of actual requirement prior to ordering.				

31	Supply and fixing of single light wall bracket on matching M.D.F.E.G. Board base etc. complete in all respect.	No.	1910.08	1.00	1910.08
32	Supply and fixing of recess mounting round Ceilling cutout 160 mm height 55 mm 18 Watt LED Down Lighter having Powder coated die cast aluminium housing with heat sink, diffuser/ Reflector and driver set complete in all respect.	No.	2164.76	4.00	8659.04
33	**Supply of Ceiling Fan of 1200mm sweep complete erected in position with all accessories.**	**No.**	1120.98	**1.00**	1120.98
	Sub Head - V: Server, Data & Voice Networking				
34	Supplying and drawing following pair 0.5 sq mm FR PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/ recessed steel/ PVC conduit as required.				
35	2 Pair	Metre	23.15	150.00	3472.88
36	Supplying and fixing following **modular switch/ socket** on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
37	Telephone socket outlet	Each	137.76	11.00	1515.33
38	Supplying and fixing following size/ modules, GI box alongwith modular base & cover plate for modular switches in recess etc as required.				
39	1 or 2 Module (75mmX75mm)	Each	281.30	11.00	3094.33
	Supply, fixing and concealing 2mm thick PVC conduit pipe with ISI mark embossed and with PVC accessories confirming to IS no. 3419 for drawing wires duly sealed at joints with original resin/adhesive to make the complete piping rigid, plastering with cement sand motar finished to the level with matching colour wash including cost of all material labour and T & P etc required for proper completion of the work as per directions and to the satisfaction of Engineer in charge.				
40	25 mm dia 2 mm thick PVC Conduit.	Metre	83.35	12.00	1000.19
41	32 mm dia 2 mm thick PVC Conduit.	Metre	100.71	10.00	1007.13
42	Supplying and drawing of UTP 4 pair CAT 6 LAN Cable in the existing surface/ recessed steel/ PVC conduit as required.				

43	1 run of cable	Metre	56.72	95.00	5388.74
44	Supplying, fixing, connecting & testing of **Telephone Tag Block** krone type in a suitable size 1.6 mm thick dust and vermin proof Sheet steel enclosure duly painted by synthetic enamel over anti corrosive primer, lockable and hinged cover with provision for cable through glands complete in all respects.				
	10 pair Krone	Each	2350.00	1.00	2350.00
45	Supplying, laying, testing and commissioning of following size anealed tinned copper conductor PVC insulated and sheathed **armoured copper telephone cables** with suitable clamps, saddles and including making terminal joints complete as required.				
	10 pair	Mtrs	260.00	10.00	2600.00
46	Supply,installation, testing & commissioning of a computer data outlet grid plate mounted unit with 1 No. RJ-45 socket, moulded cover plate in recessed GI box complete as required for Data system in existing conduit.(Make- Legrand, Cat no- 6755 45)	Each	190.00	10.00	1900.00
	Equipment				
47	Supply, installation, testing & commissioning of Cat6 IO with Faceplate complet in all respect.	No	350.00	20.00	7000.00
48	Supply, installation, testing & commissioning of 24 port loaded Patchpanel for Data complet in all respect.	No	3980.00	1.00	3980.00
49	Supply, installation, testing & commissioning of Cat6 patchcord 1 mtr User Side complet in all respect.	No	170.00	20.00	3400.00
50	Supply, installation, testing & commissioning of Cat6 patchcord 2 mtr Rack Side complet in all respect.	No	330.00	4.00	1320.00
	Sub Head-VI : Cable & End Terminations				
51	Supplying and laying of aluminium conductor PVC insulated armoured served sheathed cable 1100V grade at a depth of 750mm below ground level over a cushion of 75mm thick sand all around the protected with burnt bricks on sides and on top.On surface/ cable tray the cable run shall be fix on M.S. clamps etc. of suitable size or as directed by engineer incharge, complete in all respect. The armouring of the cable shall be properly connected with the earth conductor by clamp etc.				

	4 core 6 sq. mm	Metre	343.81	60.00	20628.88
	Supplying and laying of brass nickle plated compression gland for PVC insulated & armourd served sheathed, under ground cable including rubber ring etc. complete in all respect. The armouring of the cable shall be properly connected with the earth as per direction of ingineer in charge.				
52	2 core 6 sq. mm	Each	87.98	10.00	879.80
53	4 core 6 sq. mm	Each	92.61	2.00	185.22
	Supplying and fixing of plain orpin type copper tin plated cable socket (Lug) to the cable leads, insulating with tape & making connection etc. complete in all respect as per direction of the Engineer Incharge.		0.00		
54	10 sq. mm	Each	23.15	8.00	185.22
55	35 sq. mm	Each	35.89	6.00	215.32
	Sub Head -VII : Earthing Work		0.00		
56	Supplying and burying of 600mmx600mmx6.0mm G.I. plate vertically for earthing with its top at least 3 metre below ground level complete with 20mm dia G.I. pipe for watering and earthing lead of no. 8 to 10 SWG GI wire in 15 mm dia GI pipe up to switch board(and from appron to switch board the cost of GI pipe & G.I. wire will be extra) 30 cm square CI box with hinged cover masonary housing alternate layers of charcoal/coke & salt atleast 150mm thick around etc as per direction of engineer in charge complete in all respect as per drawing.	Each	6228.02	2.00	12456.05
57	Supplying and laying of 32mmx6mm G.I. strip from earth electrode directly in the ground as required complete in all respect.	Metre	173.64	24.25	4210.86
58	Supplying and fixing of one number 8 SWG G.I. wire in 15mm dia G.I. pipe for earthing, laid in ground or in wall duly concealed including the cost of cement, sand, labour, T & P other material required for proper completion of the work as directed at site.	Metre	231.53	22.75	5267.19
	Sub-Head -VIII : Conventional Fire Alarm & Detection System				

59	Providing, fixing, testing and commissioning of resettable type **manual call points** as per specifications.The manual call point should have an indicator, which should "blink" in stand by condition.	Nos.	4467.27	3.00	13401.82
60	Providing, fixing, testing and commissioning of electronic hooters with LMT (hooters shall also be able to work as public address systemsounders) housed in sheet steel / Polymer housing suitable for wall /ceiling and surface / recess mounting including making connectionswith wires complete in all respects and as per specifications.	Nos.	4044.74	3.00	12134.23
	Conduits And Cables				
61	Supplying and drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surface/recessed steel/ PVC conduit as required. 2 x 1.5 sq. mm	Metre	47.46	466.00	22117.58
	Supply fixing and concealing **rigid steel conduit pipe** in the wall including cutting of brick work, laying of conduit and fixing it with M.S. hooks and then plastering with cement, sand motar finished to the level, with matching color wash including cost of proper threading of the conduit and providing necessary sockets, bends and chuck nuts as directed by the engineer-in-charge with supply of all material labour and T&P required for proper completion of work. (for Telephone / Television / circuits)				
62	25 mm dia. conduit (16 SWG) thick	Metre	180.59	500.00	90294.75
	Sub-Head -IX : Vertical Transportation (Lift)				
63	Delivery complete installation, and testing of elevatots of schindler make, schindler, johnson , Kone or equ.				
	Schindler 3300IN's Elevator 00200 with Passenger Capacity-12, and 2 stops complete.	Nos.	1983750.00	1.00	1983750.00
	HVAC Work				
	Equipment:				
64	Providing & fixing control cum transmission wiring of 3 core x 1.5 sqmm copper in suitable 25 mm dia heavy duty PVC conduits or wall chase or refrigerant piping between indoor units and outdoor units and indoor units and wired controllers.	Rmt	173.30	40.00	6932.00

81	**Air Distribution (For Factory Fabricated Ducts As Per "SMACNA" Standards & Specifications)**	-		-	
82	Supplying and fixing of following thickness duly laminated aluminum foil of mat finish closed cell Nitrile rubber (Class "O") insulation on existing duct after applying suitable adhesive for Nitrile rubber. The joints shall be sealed with 50 mm wide and 3 mm thick self adhesive nitrile rubber tape insulation complete as per specifications and as required.				
83	19 mm	Sqmt	806.86	5.00	4034.30
84	Wiring for light/ power plug with 2X4 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed medium class PVC conduit alongwith 1 No. 4 sq. mm FRLS PVC insulated copper conductor single core cable for loop earthing as required.	Meter	231.53	167.00	38664.68
85	S&F of 6 Amp. to 32 Amp. 4 pole MCB (10 KA) C Curve, Cat-A	Each	856.64	2.00	1713.29
86	S&F of 40 Amp. 4 pole MCB (10 KA)	Each	2633.60	1.00	2633.60
				Total Schedule B Electrical Items	**2416344.41**
				Total of Schedule (A+B)	**3252860.06**

Please Note:

1. The Bidder with the lowest quoted cost for Supply, installation, testing and commissioning of Lift work and associated work at proposed 3 rd floor entrance at NMRC Head Office, Ganga shopping, complex, sector-29, Noida. in the financial quote (L1 bidder) shall be selected for the award of contract.
2. The Bidder shall be required to quote the percentage in the BOQ.
3. It will be deemed to include all Taxes including GST, Duties, Octroi, Royalty etc., cost of all plants, labour, supervision, materials, transport, all temporary works, erection, maintenance, utility identification, contractor's profit and establishment/ overheads, together with preparation of design and drawings, all general risks, insurance liabilities, compliance of labour laws and obligations set out or implied in the contracts.
4. Labour cess will be 1% of the BOQ Amount.
5. The work executed against the BOQ items in would be paid on measurement basis.
6. The Financial Bid submitted is unconditional and fulfils all the requirements of the TOR Document.
7. We have completely read and understood the Bid Document. The Financial Tender submitted is unconditional and fulfils all the requirements of the Tender Document.
8. Our Financial Proposal shall be binding upon us subject to the modifications resulting from contract negotiations, up to expiration of the validity period of the Proposal. We understand you are not bound to accept any Proposal you receive.

_____

Signature and Name of the Authorized Person

_____

NAME OF THE BIDDER AND SEAL

7.19. Form 19: Bid Details

The following list is intended to help the Bidders in submitting offer which are complete. An incomplete offer is liable to be rejected. Bidders are advised to go through the list carefully and take necessary action.

S. No.	Particulars	Attached Yes / No / Not Applicable	Page no. (Mandatory)
1	Bid Processing Fees		
2	Earnest Money Deposit		
3	Form 1: Letter of Proposal Submission		
4	Form 2: Firm Details		
5	Form 3: Capability Statement		
6	Form 4: Work Experience		
7	Form 5: Financial Capability Details		
8	Form 6: Memorandum		
9	Form 7: Undertaking		
10	Form 8: Power of Attorney		
11	**Error! Reference source not found.**		
12	**Error! Reference source not found.**		
13	Form 11: Saleable Form for Tender Document		
14	Form 12: Declaration of Refund of Earnest Money		
15	Form 13: Undertaking pertaining to Personnel		
16	Form 14: Resources proposed for the O&M - Plant & Equipment		
17	Form 15: Proposed Personnel		
18	Form 16: Obligation/ Compliance to be ensured by Contractor		
19	Form 17: Performa for Clarifications / Amendments on the RFP		
20	Statutory proof of existence as the legal entity		
21	PAN certificate as per legal entity		
22	A copy of the Audited balance sheets and Profit and Loss Statements for the last 3 (three) financial years		
23	Self-attested copy of ITR of last 3 year.		
24	Copy of GST registration certificate, EPF, ESI		
25	Any other document asked by the Employer if submitted, specify the documents Or Any other document which the Bidder considers relevant		