भारतीय रिजर्व बैंक नोट मुद्रण प्राईवेट लिमिटेड

नैगमिक कार्यालय, बेंगलूरू

BHARATIYA RESERVE BANK NOTE MUDRAN PRIVATE LIMITED

CORPORATE OFFICE, BENGALURU

NATIONAL COMPETITIVE BIDDING (NCB) – e-TENDER (OPEN)

e-Tender Document for 'Renovation of Corporate Office Building at BRBNMPL, Bengaluru'

MSTC eTender No:
BRBNMPL/Corporate Office/Technical/2/23-24/ET/64[Renovation works of building]

To be downloaded from website www.mstcecommerce.com

निविदा सं. 008/CO/OT/2023-24 दिनांक **February 29, 2024**
Tender No: 008/CO/OT/2023-24 dated February 29, 2024

बंद होने की तिथि और निविड़ अप्राप्ति का समय/ ***Closing Date & Time for receipt of Tender***	14:30 Hrs on April 02, 2024
दस्ती निविदा प्राप्ति की जगह / ***Place of receipt of tender by Hand***	The Bids are to be submitted online at www.mstcecommerce.com/eprocn
निविदा खोलने की तिथि और समय / ***Time & Date of Opening of Tender***	15:00 Hrs on April 02, 2024
निविदा खोलने की जगह / ***Place of Opening of Tenders***	Online at www.mstcecommerce.com

Sign & Seal

भारतीय रिजर्व बैंक नोट मुद्रण (प्रा.) लिमिटेड, बेंगलूरु
BHARATIYA RESERVE BANK NOTE MUDRAN (P) LTD
BANGALORE -560029
दूरभाष / Phone: 080-66602000, 66602031
फ़ैक्स / Fax: 080 – 66602039, ई-मेल / E-Mail: cobangalore@brbnmpl.co.in
वैबसाइट / Website: www.brbnmpl.co.in

अहस्तांतरणीय / **Not Transferable**

e-Tender Document for "Renovation of Corporate Office Building at BRBNMPL, Bengaluru"

निविदा सं. 008/CO/OT/2023-24 दिनांक **February 29, 2024**
Tender No: 008/CO/OT/2023-24 dated February 29, 2024

MSTC eTender No:
BRBNMPL/Corporate Office/Technical/2/23-24/ET/64[Renovation works of building]

To be downloaded from website www.mstcecommerce.com

इस निविदा दस्तावेज़ में सम्मिलित / This document contains **347** pages

निविदा दस्तावेज़ विक्रेता **(बोलीदाता का नाम)** डाउनलोडकर्ता / The tender document is sold to:

मैसर्स / M/s. _____

पता / Address _____

इस निविदा से संबन्धित बी.आर.बी.एन. एम. पी. एल. के संपर्क व्यक्ति का / Details of Contact person in BRBNMPL regarding this tender:

नाम / Name : नंदन सिंह / Nandan Singh
पदनाम / Designation : उप महाप्रबंधक / Deputy General Manager

Address:
Bharatiya Reserve Bank Note Mudran (P) Limited,
Corporate Office
No. 3 & 4, 1st Stage, 1st Phase,
BTM Layout, Bannerghatta Road,
Bengaluru – 560029

ई-मेल/Email: nandansingh@brbnmpl.co.in, cobangalore@brbnmpl.co.in

दूरभाष / Phone: 080 – 66602000, 66602031, Fax: 080-66602039

Sign & Seal

CONTENTS OF THIS TENDER ENQUIRY

Section I	Notice Inviting Tender (NIT)	Enclosed
Section II	General Instructions to Tenderers (GIT)	Enclosed
Section III	Special Instructions to Tenderers (SIT)	Enclosed
Section IV	General Conditions of Contract (GCC)	Enclosed
Section V	Special Conditions of Contract (SCC)	Enclosed
Section VI	List of Requirements	Enclosed
Section VII	Technical Specifications / Scope of Work	Enclosed
Section VIII	Quality Control Requirements	Enclosed
Section IX	Qualification Criteria	Enclosed
Section X	Tender Form	Enclosed
Section XI	Price Schedule / Financial Bid	Enclosed
Section XII	Bidder Information	Enclosed
Section XIII	Bank Guarantee for EMD	**Not applicable**
Section XIV	Manufacturer's Authorization Form	**Not applicable**
Section XV	Bank Guarantee Form for Performance Security	Enclosed
Section XVI	Contract Form	Enclosed
Section XVII	Letter of Authority for attending a Bid Opening	Enclosed
Section XVIII	Eligibility Declarations	Enclosed
Section XIX	Proforma of Bills for Payments	Enclosed
Section XX	Proforma for Pre-Contract Integrity Pact	**Not applicable**
Annexure 1	Explanatory Note on Public Procurement (Preference to Make in India) Order, 2017	**For ~~information~~ noting of Bidder**
Annexure 2	Procedure for Purchase Preference under Make in India Order, 2017	
Annexure 3	Explanatory Note on Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012	
Annexure 4	Support to Start-Up Enterprises	
Annexure 5	Concurrent application of MSEs Order, 2012 and Make in India Order, 2017	
Annexure 6	Restrictions on Public Procurement from countries sharing land border with India	
Annexure 7	Bid Securing Declaration in lieu of EMD/Bid Security	**To be filled and submitted as part of Technical Bid, as applicable**
Annexure 8	Template for assessment of capability of Bidder	
Annexure 9	Performance Statement	
Annexure 10	Statement of Financial Standing	
Annexure 11	NEFT Mandate Form	
Annexure 12	Terms and Conditions - Compliance	
Annexure 13	Undertaking to provide financial support to our wholly owned subsidiary	
Annexure 14	Check-List for Bidders	

Sign & Seal

भाग / **SECTION- I:** निविदा आमंत्रण की सूचना / **NOTICE INVITING TENDER (NIT)**

भारतीय रिजर्व बैंक नोट मुद्रण (प्रा.) लिमिटेड, बेंगलूरु
BHARATIYA RESERVE BANK NOTE MUDRAN (P) LTD
BANGALORE -560029
दूरभाष / Phone: 080-66602000, 66602031
फ़ैक्स / Fax: 080 – 66602039, ई-मेल / E-Mail: cobangalore@brbnmpl.co.in
वैबसाइट / Website: www.brbnmpl.co.in

निविदा सं. 008/CO/OT/2023-24 दिनांक **February 29, 2024**
Tender No: 008/CO/OT/2023-24 dated February 29, 2024

MSTC eTender No:
BRBNMPL/Corporate Office/Technical/2/23-24/ET/64[Renovation works of building]

1. **Notice Inviting Tender (NIT)**
e-Tenders are invited from eligible and qualified tenderers meeting Qualification Criteria (Section IX) for ~~supply~~ procurement of the following works: -

Schedule No.	Brief description of Works	Quantity (with UoM)	Earnest Money (in ₹)	Estimated cost including GST@18% (in ₹)	Remarks
I	**RENOVATION OF CORPORATE OFFICE BUILDING AT BRBNMPL, BENGALURU**	As per BOQ at Section XI: Price Schedule	**₹4.90 Lakh** (Rupees Four Lakh Ninety Thousand only)	**₹ 2,45,00,000/- (Rupees Two Crore Forty Five Lakh) only**	*For detailed Scope of work please refer Section–VI, VII*

Type of Tender (Two Bid / PQB / EOI / RC / Development / Indigenization / Disposal of Scrap / Security item etc.)	Two-part Bid (Part-I Techno-commercial bid and Part-II Financial/ Price bid)
Date of Sale of e-Tender Document	From **29/02/2024 to April 02, 2024** upto 14;30 hours website www.mstcecommerce.com
Price of the e-Tender Document	*NIL; For MSTC, refer www.mstcecommerce.com*
Place of Sale of e-Tender Document	To be downloaded from website www.mstcecommerce.com
Closing date and time for receipt of e-Tenders	**April 02, 2024 at 14:30 hours**
Place of receipt of e-Tenders	The Bids are to be submitted online at www.mstcecommerce.com/eprocn
Time and date of opening of e-Tenders	**April 02, 2024 at 15:00 hours**
Place of opening of e-Tenders	Online at www.mstcecommerce.com

2. **Bidders must read the complete 'Tender Document'**

Sign & Seal

This NIT is an integral part of the Tender Document and serves a limited purpose of invitation, and does not purport to contain all relevant details for submission of bids. Bidders must go through the complete Tender Document for details before submission of their Bids.

3. **Availability of the Tender Document**

Interested tenderers may obtain further information about this tender from the above office selling the documents. They may also visit our website mentioned above for further details. In case of e-tenders, the tender document shall be published on the nominated e-Procurement portal. It shall be available for download after the date and time of the start of availability till the deadline for availability. Unless otherwise stipulated, the downloaded Tender Document is free of cost. If the office happens to be closed on the deadline for submitting the bids as specified above, this deadline shall *not* be extended in case of e-tenders.

4. **Eligibility Criteria for Participation in this Tender**

Subject to provisions in the Tender Document, participation in this Tender Process is open to all bidders who fulfil the 'Eligibility' and 'Qualification' criteria. Bidder should meet the following eligibility criteria as of the date of his bid submission and should continue to meet these till the award of the contract. Bidder shall be required to declare fulfilment of Eligibility Criteria in Section XVIII (Eligibility Declarations). The Bidder, unless otherwise stipulated

(i) must,

a) be a natural person, private entity, or public entity (State-owned enterprise or institution).

b) unless explicitly permitted, not be (or proposes to be, a Joint Venture/ Consortium (an association of several persons, firms, or companies - hereinafter referred to as JV/C).

c) be a manufacturer of the product offered or be authorized representative by the Principal/OEM or be dealer authorised by the Principal/OEM.

(ii) must,

a) not be insolvent, in receivership, bankrupt or being wound up, not have its affairs administered by a court or a judicial officer, not have its business activities suspended and must not be the subject of legal proceedings for any of these reasons.

b) (including their affiliates or subsidiaries or Contractors/subcontractors for any part of the contract)

1) Not stand declared ineligible / blacklisted / banned / debarred by BRBNMPL or its subsidiaries or by Ministry / Department of GoI from participation in their Tender Processes or by any Government Agency anywhere in the world, for participating in their tenders, under that country's laws or official regulations; and / or

2) Not be convicted (within three years preceding the last date of bid submission) or stand declared ineligible / suspended / blacklisted / banned / debarred by appropriate agencies of Government of India from participation in Tender Processes of all of its entities, for:

- offences involving moral turpitude in business dealings under the Prevention of Corruption Act, 1988 or any other law; and/or
- offences under the Indian Penal Code or any other law for causing any loss of life/ limbs/ property or endangering Public Health during the execution of a public procurement contract and/ or
- suspected to be or of doubtful loyalty to the Country or a National Security risk as determined by appropriate agencies of the Government of India.

3) Not have changed its name or created a new business entity as covered by the definition of "Allied Firm", consequent to having been declared ineligible/ suspended/ blacklisted/ banned/ debarred;

4) Not have an association (as a bidder/ partner/ director/ employee in any capacity)

- of retired official of BRBNMPL if such a retired person has not completed the cooling-off period of one year after his retirement. However, this shall not apply if such officers have obtained a waiver of the cooling-off period from their erstwhile organisation.
- of the near relations of executives of BRBNMPL involved in this Tender Process

c) Not have a conflict of interest, which substantially affects fair competition. The prices quoted should be competitive and without adopting any unfair/ unethical/ anti-competitive means. No attempt should be made to induce any other bidder to submit or not to submit an offer for restricting competition

(iii) must fulfil any other additional eligibility condition, if any, as may be prescribed elsewhere in Tender Document.

(iv) must provide such evidence of their continued eligibility to the Procuring Entity if so requested.

(v) of Class-II Local Suppliers and Non-Local Suppliers (as defined in Make-in-India policy) shall be eligible subject to certain conditions as detailed subsequently.

(vi) from specified countries having land borders with India (but not in development partnership with India) shall be eligible subject to certain conditions as detailed subsequently.

(vii) If this to be a procurement process for the second stage of two-stage / Pre-Qualification Bidding (PQB) after shortlisting qualified bidders in the EoI / PQB stage, then only the bidders shortlisted / qualified in the first stage shall be eligible to participate.

5. **Purchase Preference Policies of the Government**

As detailed in the tender document, BRBNMPL reserves its right to grant preferences to eligible bidders under various Government Policies/directives (policies relating to Make in India; MSME; Start-ups etc.)

6. **Pre-bid Conference**

If so indicated, Bidders are requested to attend a Pre-bid conference for clarification on the Tenders' technical specifications and commercial conditions, on the time, date, and place mentioned therein. Participation in such a Pre-bid Conference is not mandatory. If a bidder does not participate or submit any query, then no subsequent representations from them regarding the Technical/ commercial specifications/ conditions shall be entertained.

7. **Submission of Bids in case of e-tenders**

(i) Bids must be uploaded on the nominated eProcurement portal (MSTC) till the deadline for submission. If the office happens to be closed on the deadline to submit the bids as specified above, this deadline shall not be extended.

(ii) Unless otherwise stipulated, **the following sections & annexures need to be filled, digitally signed and uploaded as part of the Bid: -**

1. List of Requirements – Compliance
2. Scope of Work – Compliance
3. Quality Control Requirements – Compliance
4. Section X : Tender Form (To serve as a covering letter to both the Techno-commercial & Financial Bids)
5. Section XI : Price Schedule

6. Section XII : Bidder Information
7. Section XIV : Manufacturer's Authorization Form, if applicable
8. Section XVII: Letter of Authority for attending a Bid Opening
9. Section XVIII : Eligibility Declarations
10. Section XX : Proforma for Pre-Contract Integrity Pact, if applicable
11. Annexure 7 : Bid Securing Declaration (for exempted bidders)
12. Annexure 8 : Assessment of capability of Bidder, if asked
13. Annexure 9 : Performance Statement
14. Annexure 10 : Statement of Financial Standing, if required
15. Annexure 11 : NEFT Mandate Form
16. Annexure 12 : Terms and Conditions – Compliance
17. Annexure 13 : Undertaking to provide financial support to our wholly owned subsidiary, if applicable
18. Annexure 14 : Checklist for Bidders

In addition to above, **the following sections and/or annexures need to be digitally signed and uploaded as part of the Bid: -**

1. Section III : Special Instructions to Tenderers (SIT)
2. Section V : Special Conditions of Contract (SCC)
3. Section VII : Scope of Work

(iii) Unless otherwise specified, **originals (or self-attested copies of originals – as specified therein) of specified scanned uploaded documents (except Price Schedule) must be physically submitted in a sealed cover before the bid submission deadline at mentioned venue.** Failure to do so is likely to result in the bid being rejected. If the office is closed on the deadline for physical submission of originals, it shall stand extended to the next working day at the same time and venue.

(iv) In e-tendering, if discrepancies exist between the uploaded scanned copies and the Originals submitted by the bidder, the original copy's text, etc., shall prevail. Any substantive discrepancy shall be construed as a violation of the Code of Ethics, and the bid shall be liable to be rejected as non-responsive in addition to other punitive actions under the Tender Document for violation of the Code of Ethics.

(v) In case of e-tenders, no manual Bids shall be made available or accepted for submission (except for originals of scanned copies as per sub-clause above). Bidder must comply with the conditions of the eProcurement portal, including registration, compatible Digital Signature Certificate (DSC) etc. In the case of downloaded documents, Bidder must not make any changes to the contents of the documents while uploading, except for filling in the required information.

8. **Bid Opening in case of e-tenders**

Bids received shall be opened online at the specified date and time. If the office is closed on the specified date of opening of the bids, the opening shall be done on the next working day at the same time.

9. Tenderers are required to register themselves online at www.mstcecommerce.com. They may obtain further information about the tender from the office issuing the tender or visit our website www.brbnmpl.co.in.

10. **Guidelines for filling in MSTC Portal**

A. **Registration:** The process involves vendor's registration with MSTC e-procurement portal which is free of cost. Only after registration, the vendor(s) can submit his/their bids electronically. This submission of bids shall be done over the internet. The Vendor should possess a valid Class III signing and encryption type digital signature certificate. Vendors are to make their own arrangement for bidding

from a computer connected with Internet. MSTC is not responsible for making such arrangement. (Bids will not be recorded without Digital Signature).

SPECIAL NOTE: THE PRICE BID SHALL HAVE TO BE SUBMITTED ON-LINE AT www.mstcecommerce.com/eprocn

(i) Vendors are required to register themselves online at https://www.mstcecommerce.com/eprocn → Register (Filling up details and creating own user id and password) → Submit. Please follow the 'Registration Guide' available in the Registration link before proceeding.

(ii) Vendors will receive a system generated mail confirming the registration in their email which has been provided during filling the registration form.

(iii) The Vendors shall have to subscribe to the buyers and categories in order to receive system generated mails. In order to subscribe, a vendor has to login and click on 'My Subscription' followed by 'Add Subscription'. On successful subscription, a system generated mail shall be forwarded to the vendor. Please follow the guide for 'Subscription' of 'Download Guides' available in the Dashboard before proceeding.

In case of any clarification, please contact BRBNMPL/MSTC, (at least 07 days prior to the scheduled opening of the e-tender).
Contact Persons (BRBNMPL):
Mr. Nandan Singh, DGM
दूरभाष / Phone: 080 – 66602000, 66602031, Fax: 080-66602039
E-mail: nandansingh@brbnmpl.co.in

Contact Persons (MSTC):
Helpdesk: +91 7969066600
E-mail: helpdesk@mstcindia.co.in

B. **System Requirement:**

a) Operating System –Windows 7 and above

b) Web Browser - Google Chrome /Edge/ Firefox

c) System Settings: As the procedure mentioned in the webpage: https://www.mstcecommerce.com/eprocn

d) Java: JRE 8 Latest update

C. **Type of Tender**

(i) **Part I:** Techno-Commercial bid will be opened electronically on specified date and time as given in the NIT. Bidder(s) can witness electronic opening of bid.

(ii) **Part II:** Price bid will be opened electronically of only those bidder(s) whose Part-I: Techno-Commercial Bid is found to be Techno-Commercially acceptable by BRBNMPL. Such bidder(s) will be intimated date of opening of Part II Price bid, through valid email confirmed by them.

D. All entries in the tender should be entered in online Technical & Commercial Formats without any ambiguity.

E. **Special Note towards Transaction fee:**

The vendors shall pay the transaction fee (non - refundable) to MSTC using "Transaction Fee Payment" Link under "My Menu" in the vendor login. The vendors have to select the particular tender from the event dropdown box. The vendor shall have the facility of making the payment either through NEFT or Online Payment. Bidders are advised to remit the transaction fee well in advance before the closing time of the event so as to give themselves sufficient time to submit the bid.

Bidders may please note that the transaction fee should be deposited by debiting the account of the bidder only; Transaction Fee deposited from or by debiting

any other party's account will not be accepted. Transaction Fee is non - refundable.
In case of failure to access the payment towards Transaction Fee for any reason, the vendor, in term, will not have the access to online e-tender.

F. In case of failure to access the payment towards cost of tender document & EMD for any reason, the vender, in term, will not have the access to on line e-tender and no correspondence in this respect will be entertained and BRBNMPL will not be responsible for any such lapses on this account. Bidder(s) are advised to make remittance of tender fee and EMD through Bank Draft / Banker's Cheque / Pay Order etc. well in advance and upload the scanned copy of the same.
Vendors are instructed to use Upload Documents link in my menu to upload documents in document library. Multiple documents can be uploaded.
Once documents are uploaded in the library, vendors can attach documents through Attach Document link against the particular tender. For further assistance, please follow instructions of vendor guide.

G. All notices and correspondence to the bidder(s) shall be sent by email only during the process till finalization of tender by BRBNMPL. Hence the bidders are required to ensure that their corporate email I.D. provided is valid and updated at the stage of registration of vendor with MSTC (i.e., Service Provider). Bidders are also requested to ensure validity of their DSC (Digital Signature Certificate).

H. (i) Please note that there is no provision to take out the list of parties downloading the tender document from the website mentioned in NIT. As such, bidders are requested to see the website once again before the due date of tender opening to ensure that they have not missed any corrigendum uploaded against the said tender after downloading the tender document. The responsibility of downloading the related corrigenda, if any, will be that of the downloading parties.

(ii) No separate intimation in respect of corrigendum to this NIT (if any) will be sent to tenderer (s) who have downloaded the documents from website. Please see website www.mstcecommerce.com/eprocn of MSTC Ltd.

I. e-tender cannot be accessed after the due date and time mentioned in NIT.

J. Bidding in e-tender:

(i) Bidder(s) need to submit necessary EMD/ EMD declaration on letter head, Cost of Tender documents and Transaction fees to be eligible to bid online in the e-tender. Cost of Tender documents and Transaction fees are non-refundable. No interest will be paid on EMD. EMD if submitted of the unsuccessful bidder(s) will be refunded by BRBNMPL.

(ii) The process involves Electronic Bidding for submission of Techno Commercial Bid as well as Price Bid.

(iii) The bidder(s) can submit their Bid through internet in MSTC Website **www.mstcecommerce.com/eprocn**

(iv) The bidder should allow to run an application namely en Apple by accepting the risk and clicking on run. This exercise has to be done twice immediately after clicking on the Techno-Commercial bid. If this application is not run, then the bidder will not be able to save / submit his bid.

(v) In order to submit bid, a vendor has to go to 'Events' from the menu and select 'Bid Floor'. The vendor has to select the buyer 'MSTC Limited' from the buyer list in order to view the live events list. The correct event has to be selected from the event list for participation. A vendor has to submit 'Eventwise bid details' that may consist of 'Pre-Qualification Criteria', 'Common Terms' and/ or 'Document Attach'. A vendor must save the Pre-Qualification Criteria, Common Terms and/ or attach documents by clicking

the respective buttons. Once the event specific bids are saved, the status is updated in 'Event specific bid status' and the 'Item specific bid' button appears on the bid floor. Thereafter vendor must click button under 'Technical Cover' in order to save the technical bid for specific lots. Once the technical bid is saved, the 'Price Cover' button appears on the screen for respective lots. Once price bid is saved, the vendor must click on 'Final Submit'. On final submission of bid, the status of the bid submission shall display 'Bid submitted' under 'Item specific bid status'. A vendor shall receive system generated mail.

(vi) The bid cannot be revised once the Final Submit button has been clicked by the bidder. However, if the bidder wishes to change their bids, then they may delete the bid and re- submit the same.

a) In all cases, bidder should use their own ID and Password along with Digital Signature at the time of submission of their bid.

b) During the entire e-tender process, the bidders will remain completely anonymous to one another and also to everybody else.

c) The e-tender floor shall remain open from the pre-announced date & time and for as much duration as mentioned above.

d) All electronic bids submitted during the e-tender process shall be legally binding on the bidder. Any bid will be considered as the valid bid offered by that bidder and acceptance of the same by the Buyer will form a binding contract between Buyer and the Bidder for execution of supply. Such successful tenderer shall be called hereafter CONTRACTOR.

e) It is mandatory that all the bids are submitted with digital signature certificate as otherwise the same will not be accepted by the system.

f) No deviation of the terms and conditions of the tender document is acceptable. Submission of bid in the e-tender floor by any bidder confirms his acceptance of terms & conditions for the tender.

g) Unit of Measure (UOM) is indicated in the e-tender Floor. Rate to be quoted should be in Indian Rupee as per UOM indicated in the e-tender floor / tender document.

K. Any order resulting from this e-tender shall be governed by the terms and conditions mentioned therein.

11. The online tender should be submitted strictly as per the terms and conditions and procedures laid down in the website www.mstcecommerce.com/eprocn of MSTC Ltd.

12. Bids must be uploaded on the MSTC Website www.mstcecommerce.com/eprocn till the deadline for submission. If the office happens to be closed on the deadline to submit the bids as specified above, this deadline shall not be extended.

13. **Earnest Money Deposit (EMD)** may be furnished through following modes of payment:-

(i) Insurance Surety Bond

(ii) Account Payee Demand Draft / Banker's cheque drawn from any branch of SBI in India, in favour of Bharatiya Reserve Bank Note Mudran Private Limited, payable at Bengaluru.

(iii) Online Bank Transfer (Proof of online transfer should be submitted along with the Techno- Commercial Bid (Part - I)) through NEFT/RTGS can be made at the following BRBNMPL account maintained with State Bank of India, Overseas Branch, Bengaluru: -

Account Number	**00000010605523157**
IFSC Code	**SBIN0006861**

(iv) Other Electronic Modes of Payment as per UPI id and QR code given below: -

a) Other Electronic mode of payment such as Debit Card powered by RuPay

b) Unified Payments Interface (UPI) (BHIM-UPI), Unified Payments Interface Quick Response Code (UPI QR Code) (BHIM-UPI QR Code)

Note: In case of (b) and (c) mode of payments, bidders are requested to send proof of the same, after completion of transaction, to the contact email given in the tender by giving reference of the Tender number, Name of company/firm and mobile number.

14. Exemption **for MSEs and Startups:** The tenderers who are currently registered and shall continue to remain registered during the tender validity period with BRBNMPL (except for NCB/ICB Tender) or as a Micro and Small Enterprise (MSE) as defined in MSEs Order 2012 issued by Ministry of Micro, Small and Medium Enterprises (MoMSME) or as a Startup as recognised by Department for Promotion of Industry and Internal Trade (DPIIT), are exempted from payment of **tender fee** and **earnest money deposit (EMD)**. In case the tenderer falls in these categories, it should furnish certified copy of its valid registration details (registration with BRBNMPL or as a MSE or Startup, as the case may be).

The vendors registered with the Central Purchase Organization such as GeM as "Registered Suppliers" may also be considered as registered suppliers for BRBNMPL.

15. All Bidders shall have to sign the Integrity Pact with the purchaser as per format given in Section XX, otherwise, their bids are liable to be summarily rejected. Details of IEM for this tender is furnished below: - *(If applicable for the tender)*

Name : /

Address : ***(Not applicable for this tender)***

Email : /

16. Tenderer shall note that the tender document is kept same for all schedules, if more than one schedule is specified, for administrative convenience. BRBNMPL reserves the right to conclude contract for each schedule independently as per the response and qualification.

17. Submission of authentic documents in time is the prime responsibility of the bidder. In case of ambiguity or incomplete documents pertaining to bid submitted, bidders may be given **only one opportunity with a fixed deadline after bid opening** to provide complete and unambiguous documents in support of meeting Pre-Qualification Criteria. In case the bidder fails to submit any document or submits incomplete documents within the given time, bidder's tender shall be rejected.

18. BRBNMPL reserves the right to complete the evaluation based on the details furnished with the bid without seeking any additional information.

19. The tenderer shall satisfy BRBNMPL that they are competent and authorized to submit tender and/or to enter into a legally binding contract with BRBNMPL.

20. **Incomplete Bid documents submitted not in accordance with the directions issued shall be liable for rejection. A Tender shall be liable for rejection in the following circumstances:**

- **Non-submission of EMD or "Bid Securing Declaration in lieu of EMD"** in the Company Letterhead as per Annexure 7.
- Does not fulfil minimum pre-qualification criteria as per the Tender Documents.
- Submits the tender late i.e., after due date and time.
- Unsolicited bids (applicable for LTE only).
- Stipulates the validity period less than what is stated in the Tender Documents.
- Stipulates his own conditions and does not agree to withdraw the deviations, rendering his bid unacceptable.
- Does not disclose the full names and addresses of all his Partners or Directors as applicable wherever called for in the tender.
- Does not submit bid in the prescribed format making it impossible to evaluate the bid.
- Indulges in tampering of tender documents.
- Does not conform to any tender condition which stipulates non-conformance of tender conditions as a rejection criteria.
- States any counter condition.
- **Bidders who have been black listed /debarred by BRBNMPL or any PSU or any Government Department and stands black listed /debarred in the last 5 years (as on tender opening date) are not eligible to participate in this tender.**

21. No counter condition/s shall be accepted against the tender enquiry.

22. If any clarification is required on this tender, bidders are advised to send their request in writing to the contact details mentioned at Page 1 of this tender so as to reach **at least 07 days prior** to date of opening of the tender.

23. **Disclaimers and Rights of Procuring Entity**

The issue of the Tender Document does not imply that BRBNMPL is bound to select bid(s), and it reserves the right without assigning any reason to

(viii) reject any or all of the Bids, or
(ix) cancel the tender process; or
(x) abandon the procurement of the Works; or
(xi) issue another tender for identical or similar Works

Important Note: Offers submitted not in line with the above guidelines will be liable for rejection.

For and on behalf of BRBNMPL,

--Sd--
(Nandan Singh)
Dy. General Manager

ई-मेल/Email: nandansingh@brbnmpl.co.in
दूरभाष / Phone: 080 – 66602000, 66602031, Fax: 080-66602039

बोलीदाताओं के ध्यानार्थ निविदा की महत्वपूर्ण शर्तों पर एक नजर

IMPORTANT TENDER CONDITIONS AT A GLANCE FOR ATTENTION OF BIDDERS

1. **निविदा की वैधता / Validity of Tender**: The quoted rates shall be valid for a period of 120 days from the date of opening of the tenders. If any tenderer withdraws his tender before the said period or makes any modification in the Price Bid or terms and conditions of the tender then, BRBNMPL, without prejudice to any other right or remedy will be at liberty to take action as deemed fit.
2. **ई.एम.डी / E.M.D:** Your tender / quotation should be accompanied with an Earnest Money Deposit (EMD) of ₹ 4,90,000/- (Rupees Four Lakh Ninety Thousand) only in Part-I Technical bid. EMD is payable in the same way as mentioned for Tender fee
    a. As per GIT Clause 18 under Section II
    b. All bidders shall be required to sign the bid securing declaration as per proforma attached at Annexure-7.
3. **संविदा का मूल्य / Contract Price:**

   The rates quoted in the tender shall be based on the technical specifications, scope of work and actual work carried out. The rates quoted in the tender shall include all charges for clearing of site before commencement as well after completion. The rate quoted shall be deemed to be for the finished work to be measured at site. The rate quoted shall also be firm irrespective of any variation in quantities of items given in the schedule of items.
4. **Delivery Schedule / Completion Time:** The work should be completed as per as per bill of quantities and scope of work within Twelve (12) months from the date of issue of LoI / work order / contract. Any requests for extension of time may be initiated two weeks before the scheduled completion date citing the reasons for delay which may be granted with or without imposition of LD.
5. **वैकल्पिक मात्रा /अतिरिक्त कार्य आदेश / Optional Quantity/Additional Work order**:

   Quantities mentioned in the schedule of items are approximate and may vary as per actual work done/ site requirement. The contractor shall not claim any extra rate on this account and the payment shall be made as per the actual work done. BRBNMPL may extend the Work order/place additional work order at a later date at the quoted rates.
6. The successful contractor has to visit the site before commencement of work and procure the materials as per the site requirement. Payment shall be made as per actual certified work and no payment will be made against the extra quantity brought to site.
7. **अवार्ड की अधिसूचना / Notification of Award**: BRBNMPL shall issue Notification of award / LOI to the L1 bidder by post or by fax/email (to be confirmed by post) that its tender for Captioned Subject, has been accepted, briefly indicating therein the essential details of work and corresponding prices accepted. The successful tenderer/Contractor shall mobilize all men required for timely performance involving various activities and start the work from the date mentioned in Notification of Award. Contractor should return back the duplicate copy of Notification of Award duly signed and stamped in each page as acceptance within 07 days of the issue of the same.
8. **सुरक्षा जमा/निष्पादन बॉन्ड / Security Deposit/Performance Bond**:
9. Within twenty-one days after the issue of notification of award by BRBNMPL, the supplier shall furnish Security Deposit to BRBNMPL for an amount equal to 10% of the Order Value by way of DD/BG, valid up to Sixty days after date of completion of all contractual obligations, including warranty period. (Please refer GCC Clause 6 under Section IV.). Failure of the successful tenderer in providing performance security within 21 days of receipt of notification of award and / or returning of duplicate copy of Notification of Award/ LOI duly signed shall make the tenderer liable for forfeiture of its EMD and, also, for further actions by BRBNMPL including cancellation of the tender/contract.
10. **संविदा का करार / Contract Agreement:** A formal agreement has to be executed between the contractor and BRBNMPL on ₹ 200/-Non-judicial stamp paper purchased by the contractor within two weeks of receipt of Security Deposit/Performance Bond as per the format given in SECTION-XVI. In case Contractor fails to complete the formalities for execution of agreement, Work Order shall be cancelled. In such case, EMD / SD of the contractor shall be forfeited and BRBNMPL may initiate appropriate action as deemed fit.
11. **परिसमापन हर्जाना / Liquidated Damages - Compensation for Delay:**

If the supplier fails to deliver any or all of the goods within the time frame (s) [delivery schedule] incorporated in the contract, BRBNMPL shall, under the contract deduct from the contract price, as liquidated damages, a sum equivalent to the 0.5% of the delivered price of the delayed goods and/ or services for each week of delay or part thereof until actual delivery or performance, subject to a maximum deduction of the 10% (or any other percentage if prescribed in the SCC) of the delayed goods' or services' contract price(s). [Please refer GCC Clause 24 under Section IV].

12. **Pre-Bid Visit / Clarification of Bidders**: **:** The bidders **shall visit the site** and shall have clear understanding about scope of work, volume of work, requirement of materials, requirement of skill levels of workforce etc. and any doubt/clarification may be cleared/done before submitting their offers. Any claim of ignorance about the system or responsibility shall not be accepted at later stage.

    The Bidder, at the Bidder's own responsibility and risk is encouraged to visit the work site and its surroundings to examine and obtain all information that may be necessary for preparing the Bid and entering into a contract for the work as mentioned in the Notice Inviting Tender. The cost of visiting the site shall be at the Bidder's own expense.

13. Payment Terms: No mobilization advance shall be paid.
    a. R/A Bills:
        i. The value of work done, less recovery if any will be payable as per progress of work as running account bills subject to satisfactory completion of work as per measurements submitted for certification to BRBNMPL Officer in MS excel, MS sheets in standard measurements sheets. Deductions will comprise the deductions as stipulated including statutory deduction.
        ii. All progress payments made / R/A bills paid shall be regarded as payment by way of advance against final payment only and not as payment for the work completed.
        iii. The contractors must finally compete the work strictly in accordance with the specifications and drawings, if required, by reconstructing or rectifying faulty work.
        iv. All R/A bills / invoices for progress payments as well as for final payments shall be submitted in prescribed computerized forms supported by detailed measurement of items of work.
        v. The minimum value of interim bill/monthly bill/progressive running account (R/A) bill shall not be less than ₹ 30 Lakhs (Rupees Thirty Lakhs) only as mentioned in the tender form. The contractor has to submit the final bill within two months from the date of completion of work.
        vi. The bill should be submitted along with the all the supporting documents.
        vii. All payments to the Bidder shall normally be made by Electronics clearing facility.
    b. Final Bill:
        i. The Bidder shall submit the final bill within 2 (two) months from the date of completion of the works. The final bill submitted by the Bidder shall be processed for payment only after receipt of "No claim certificate" and the clearance of site of all rubbish, debris, vats, tanks, materials, temporary structures, machinery, etc. and handing over the site in a tidy and clean condition to the BRBNMPL.
14. All payments to the Bidder shall normally be made by Account Payee Cheques/Electronics clearing facility. All Bank charges in connection with payment by way of Demand Draft on specific request to the Bidder shall be borne by the Bidder /RTGS on submission of the request by the bidder as per Finance Department requirement.
15. Extra Items: Any extra items that are found to be necessary during the course of work, the same shall have to be executed by the contractor. The rates for the same shall be derived from KPWD/CPWD Schedule of rates or Market rates (for items which are not included in the schedule of rates + 10% over head /profit. However, before executing, prior approval shall be obtained from BRBNMPL.
16. The calculations made by the tenderer should be based upon probable quantities of several items of work, which are furnished for the tenderer's convenience in the schedule of probable quantities, but it must be clearly understood that the contract is not a lump sum contract.

17. The successful tenderer is bound to carry out any items of work necessary for the completion of the job though such items as are not included in the quantities and rates with the written approval of the employer.
18. दोष दायित्व अवधि / Defects Liability Period:

    Any defect, cracks, patches or other faults which may appear within the "Defects Liability Period" stated in the Appendix hereto or, if none stated, then within 12 months after the completion of works, arising in the opinion of the BRBNMPL from materials or workmanship not in accordance with the bidder , shall upon the directions in writing of the BRBNMPL , and within such reasonable time as shall be specified therein, be amended and made good by the Bidder , at his own cost and in case of default the BRBNMPL may employ and pay other persons to amend and make good
19. भुगतान रोकना / Withholding of Payments: BRBNMPL may withhold payment or, on account of subsequently discovered evidence, nullify the whole or a part of any payment certificate to such extent as may be necessary to protect BRBNMPL from loss on account of the following:
    a. Defective work pointed out by BRBNMPL and not remedied by the Contractor.
    b. Failure of the Contractor to make payments properly and regularly to his own workers, to his suppliers, etc.
    c. Damage by the Contractor to the work of other Contractors.
    d. A reasonable doubt that the Contract cannot be completed for the balance unpaid amount.
    e. A reasonable doubt that the Contractor intends to leave work items incomplete.
    f. Failure of the Contractor to execute the Works in conformity with the Contract Documents.
    g. Failure of the Contractor to meet or keep-up with the approved Construction Program.
    h. Failure of the Contractor to comply with and all contractual obligations and liabilities stipulated in the Contract Documents.
20. Parties who have been black listed /debarred by BRBNMPL or any PSU or any Government Departments are not eligible for submission of this tender.
21. BRBNMPL does not pledge itself to accept the lowest or any tender and reserves to itself the right of accepting/rejecting the whole or any part of the tender or portion of the quantity tendered without assigning any reason thereof.
22. If the tenderer is registered under NSIC/MSE, New Delhi they have to clearly mention and submit a copy of supporting documents. In absence of any such declaration, tenderer shall be considered as not registered under NSIC/MSE, New Delhi. Tenderer registered with NSIC are eligible for exemption of only EMD. As regarding SD, the tenderer who are registered with NSIC/MSE should submit an undertaking for payment of SD in case they become L1 firm in bid process and this undertaking letter should be attached to the Technical Bid-Part-I.
23. The Contractor's co-ordination with other agencies appointed by BRBNMPL is essential to maintain smooth progress of the work and any delay, which in the opinion of BRBNMPL if due to non-co-ordination and inefficient management of the contractor will not be entertained.
24. प्रमाण-पत्रों की प्रतियाँ / Copies of Certificates / Documents related to company profile like GST Registration, PAN and Professional Tax Registration Certificate etc., to be provided along with the Technical Bid-Part-I.
25. अन्य अनुदेश / Other Instructions:
    a. A tenderer should quote the tender in figures as well as in words. The amount for each item should be worked out and the requisite totals given. The Rates and total amounts should be rounded off to nearest rupee value. In case of discrepancy between the rates in words and figures the rate quoted by the tender in words shall be taken as correct.
    b. The tender document should be signed on each page by the tenderer or his duly authorized representative. A certified true copy of an absolute power of Attorney in favour of signatory should accompany tender documents.
    c. Any discrepancies, omissions, ambiguities or conflicts in or among contract documents or any doubt as to their meaning should be called to the attention of The Deputy General Manager: 080 – 66602000, 66602031 within three (3) days of issue of tender. Where information sought is not clearly indicated or specified, the company

will issue a clarifying bulletin to all tenderers, which will become part of the contract. Any oral instructions will not form any part of contract.

d. The use of whitener / eraser in this tender is prohibited. If any correction becomes of necessary, the same should be done by striking off originally written rates & figures etc. and then rewritten should be done under initials of person filling the tender.
e. Please note that the contractors who have worked earlier with BRBNMPL and their performance was not found satisfactory for any of the jobs awarded to them, their tenders shall not be opened during technical bid stage and their offers shall be considered as invalid and shall be rejected.

26. No counter conditions shall be accepted.
27. All terms & conditions of this NIT shall be treated as part & parcel of the contract.
28. कंपनी के अधिकार / Rights of company:
    a. BRBNMPL does not pledge itself to accept the lowest or any tender and reserves to itself the right of accepting/rejecting the whole or any part of the tender or portion of the quantity tendered without assigning any reason thereof.
    b. If the successful bidder refuses to accept the work order or take up the job or leave the job half way after opening the quotation and becoming lowest party, BRBNMPL reserve the right to terminate the contract and forfeit the EMD / Security Deposit and no correspondence will be entertained and decision of the BRBNMPL will be final. In such case Company reserve the right to take necessary action as deemed fit against the contractor and assign another agency for completion of the leftover job and the additional cost incurred thus shall be recovered from the original contractor.
29. **क्षतिपूर्ति / Indemnity:** The Contractor shall indemnify the Employer from and against all actions, suits claims and demands brought or made against the Employer in respect of any matter or thing done or omitted to be done by the Contractor or any of his Sub-Contractor(s) or nominated Sub-Contractor(s) or their employees or workmen in the execution of or in connection with the Works of this Contract and against any loss or damage to the Employer in consequence of any action or suit being brought against the Contractor or any of his Sub-Contractor(s) or nominated Sub-Contractor(s) or their employees or workmen for anything done or omitted to be done in the execution of the Works under this Contract.
30. समाप्ति / Termination: If the Contractor shall be adjudged bankrupt or if he should make a general assignment for the benefit of his creditors, or if a receiver shall be appointed on account of his insolvency, or if he should persistently or repeatedly refuse to carry out the work diligently, or if he should fail to provide enough properly skilled workmen or proper materials or equipment or plant and machinery or tools or anything else necessary for the progress of the works in accordance with the approved scope of work or if he should persistently disregard laws or ordinances or instructions of the Employer, or if he should be guilty of a Violation of breach of any provision of the Contract, or if he has abandoned the Contract, or if he has failed to commence the works, or if he has suspended the Works, then the Employer/Employer on the basis that sufficient cause exists to justify such action, may without prejudice to any other right or remedy and after giving the Contractor seven day's notice in writing, terminate the employment of the Contractor and take possession of the premises and of all materials, equipment, tools, and plant and machinery thereon and use these as Employer's property for the completion of the Works.
31. कार्य की आभासी पूर्णता के पूर्व कार्य को ठीक करना / Correction of Work Before Virtual Completion of Works: The Employer, its representatives shall jointly conduct an extensive inspection just prior to the Virtual Completion of the Works and shall prepare a list of materials, equipment, and workmanship which are defective or damaged or of substandard quality or improperly executed or generally unacceptable due to not being in conformity with the requirements stipulated in the Contract Documents. The Contractor shall promptly remove, replace, re-execute, rectify and make good, to conform to the requirements stipulated in the Contract Documents and to the satisfaction of all concerned, all such materials, equipment, and / or workmanship included or itemised in the said list and the Contractor shall bear and pay for all expenses in connection therewith and consequent thereon and incidental thereto, including the cost for all remedial work on the work of other Contractors destroyed or damaged by such removal, replacement, re-execution, rectification and making good. If the Contractor fails to remove, replace, re-execute, rectify and make good the rejected materials equipment, and/ or workmanship within a

reasonable time, fixed by written notice, Employer may employ and pay other persons or agencies to carry out such removal, replacement, re-execution, rectification and making good and all expenses incurred in connection therewith, including all damages, losses and expenses consequent thereon and incidental thereto shall be recovered from the Contractor and shall be deducted by Employer from any money that may be payable or that may become payable to the Contractor.

32. विवादों का निपटारा / Resolution of Disputes / Arbitration: If any dispute arises after the issue of LOI /Work Order and during the execution of the project which is not resolved within 30 days of their arising, they shall be referred to a sole arbitrator to be appointed by the Managing Director of BRBNMPL. The governing law in this regard will be The Arbitration and Conciliation Act, 1996 of India. The court of Bengaluru (Karnataka State) only shall have jurisdiction to deal with and decide any legal matter of dispute whatsoever arising out of any LOI/ Work order placed by us. However, the right of giving the list of arbitrators for selection of sole arbitrator by the parties is exclusively kept reserved by BRBNMPL whose decision shall be final and binding on the parties.
33. Exemption for MSEs and Start-ups: The tenderers who are currently registered and shall continue to remain registered during the tender validity period with Central Purchase Organisation (CPO) or as a Micro and Small Enterprise (MSE) as defined in MSEs Order 2012 issued by Ministry of Micro, Small and Medium Enterprises (MSME) or as a Start-up as recognised by Department for Promotion of Industry and Internal Trade (DPIIT), are exempted from payment of tender fee and earnest money. In case the tenderer falls in these categories, it should furnish certified copy of its valid registration details (registration with CPO or as a MSE or Start-up, as the case may be).
    a. Micro & Small Enterprises must attach Registration Certificate issued by DIC / KVIC / KVIB / Coir Board / NSIC / Directorate of Handicrafts and Handlooms, or any other body specified by MSME for authentication such as Udyog Aadhaar Memorandum / Acknowledgment.
    b. SC/ST/Women entrepreneurs registered under MSEs need to submit valid documentary evidence.
34. All statutory provisions / requirements should be complied with. Records to this effect are to be maintained by the contractor / Service provider and to be shown on demand to the authorities concerned and are responsible directly to them.
35. Tenderers must mention their Income Tax Permanent Account No. (PAN), GST registration, MSME, Professional Tax Registration along with the offer, failing which the offer will liable to be rejected.
36. Parties who have been black listed /debarred by BRBNMPL/PSU or any Govt. Departments are not eligible for submission of this tender.
37. BRBNMPL does not pledge itself to accept the lowest or any tender and reserves to it the right of accepting/rejecting the whole or any part of the tender or portion of the quantity tendered without assigning any reason thereof.
38. If the tenderers registered under MSME/ NSIC, they have to clearly mention and submit a copy of supporting documents. In absence of any such declaration, tenderer shall be considered as not registered under MSME/NSIC.

(To be signed & stamped and submitted along with Techno-commercial Bid Part –I)

सेक्शन/Section II: टेंडर कर्ता की सामान्य शर्तें / General Conditions of Tenderers (GIT)

Part I: General Instructions Applicable to all Types of Tenders

A PREAMBLE

1. Introduction

1.1 Interpretations, Definitions and abbreviations which have been used in these documents, shall have the meanings as indicated in GCC.

1.2 For sake of convenience, whole of this Standard Bidding Document (including all sections) is written in reference to Procurement of Goods Tenders. However, this SBD would be utilized for all types of Tenders e.g. EOI, PQB, Rate Contract, Tenders involving Samples, Sale / Disposal of Scrap Material and Development / indigenization / Make in India etc., Procurement of Services etc. Therefore, the construction of all clauses is to be interpreted in the context of particular type of tender beyond the letter of the clause, read with the additional clauses for the specific type of tenders in Part II GIT/ GCC.

1.3 These tender documents have been issued for the requirements mentioned in Section - VI - "List of Requirements", which also indicates, inter-alia, the required delivery schedule and terms & place (i.e. destination) of delivery.

1.4 This section (Section II - "General Instruction to Tenderers" - GIT) provides the relevant information as well as instructions to assist the prospective tenderers in preparation and submission of tenders. It also includes the mode and procedure to be adopted for receipt and opening as well as scrutiny and evaluation of tenders and subsequent placement of contract. With this limited objective, GIT is not intended to be complete by itself and the rest of this document - SIT, GCC and SCC in particular may also be thoroughly studied before filling up the Tender Document. There would be certain topics covered in GIT/SIT as well as in GCC/SCC from different perspectives. In case of any conflict between these, provisions of GCC/ SCC would prevail.

1.5 The tenderers shall also read the Special Instructions to Tenderers (SIT) related to this purchase, as contained in Section III of these documents and follow the same accordingly. Whenever there is a conflict between the GIT and the SIT, the provisions contained in the SIT shall prevail over those in the GIT.

1.6 **Local Conditions** It is imperative that each bidder fully acquaints himself with all the local conditions and factors, which would have any effect on the performance / completion of the contract in all respects inter alia including the legal, environmental, infrastructure, Logistics, communications, and cost aspects. Bidders would themselves be responsible for compliance with Rules, Regulations, Laws and Acts in force from time to time in India and/ or country of manufacture & supply. On such matters, the Purchaser shall not entertain any request from the bidders.

1.7 **Obtaining the Tender Documents:** Interested tenderers may obtain further information about this requirement from the office issuing the documents, mentioned in the NIT. They may also visit website mentioned therein for further details.

1.7.1 Tenderer may also download the tender document from the website mentioned in NIT and submit its tender by utilizing the downloaded document. The bidder must not make any changes to the contents of the tender document, except for filling the required information. A certificate to this effect must be submitted by the bidder in the Tender Form (Section X).

1.7.2. The tender documents are not transferable.

2. Language of Tender

The tender submitted by the tenderer and all subsequent correspondence and documents relating to the tender exchanged between the tenderer and BRBNMPL, shall be written in English or Hindi language, unless otherwise specified in the Tender. However, the language of any printed literature furnished by the tenderer in connection with its tender may be written in any other language provided the same is accompanied by Hindi or English translation. For purposes of interpretation of the tender, the English translation shall prevail.

3. Eligible Tenderers

3.1 This invitation for tenders is open to all suppliers who fulfil the 'eligibility' and 'qualification' criteria specified in these documents. Bidder should meet (as on the date of his bid submission and should continue to meet till the award of the contract) the 'Eligibility Criteria' detailed in NIT clause 4. Please refer to Section IX - Qualification criteria and Section XVIII - Eligibility Declarations. In case of Second Stage (after the Pre-Qualification stage) of two Stage Bidding or in case of Special Limited Tenders this invitation is open only to such bidders who have been shortlisted.

3.2 The bidder, their affiliates, or subsidiaries – including subcontractors or suppliers for any part of the contract – should not stand declared ineligible/ blacklisted/banned/debarred by BRBNMPL or its subsidiaries or by Ministry / Department of GoI from participation in their Tender Processes or by any Government Agency anywhere in the world, for participating in its tenders, under that country's laws or official regulations. A declaration to this effect shall be submitted by the bidder in the Eligibility Declarations (Section XVIII).

3.3 Unless otherwise stipulated in the tender, Joint Ventures/Consortiums shall not be considered in this Tender.

3.4 Under Public Procurement (Preference to Make in India) Order 2017 (as amended/revised from time to time), entities from such countries identified as not allowing Indian companies to participate in their Government procurement shall not be allowed to participate on a reciprocal basis in this tender. For this purpose, a supplier or bidder shall be considered to be from a country if (i) the entity is incorporated in that country, or ii) a majority of its shareholding or effective control of the entity is exercised from that country; or (iii) more than 50% of the value of the item being supplied has been added in that country. Indian suppliers shall mean those entities which meet any of these tests with respect to India. Please refer to Section XVIII - Eligibility Declarations.

3.5 Orders issued by the Government of India regarding purchase preference to "Local Suppliers" to encourage 'Make in India' and promote manufacturing and production of goods and services in India shall apply to this procurement under Government of India's Public Procurement (Preference to Make in India) Order, 2017 (as amended from time to time). Please refer to Annexure 1 of this tender document.

3.5.1 **Minimum local content for eligibility to participate:** Only bidders meeting the minimum prescribed local content for the product shall be eligible to participate subject to the following conditions.

3.5.2 Based on the Make in India Policy, classes of local / non-local Suppliers eligible to participate in the tender shall be declared in the tender document. If not so declared, only Class-I and Class-II local Suppliers shall be eligible to participate and **not** non-local Suppliers.

3.6 Government of India, Ministry of Finance, Department of Expenditure, Public Procurement Division's Orders (Public Procurement 1, 2 and 3) vide F.No.6/18/2019-PPD dated 23rd/24th July 2020 (or any further amendments thereof) regarding eligibility of bidders from neighbouring countries sharing land border with India, shall apply to this tender. Please refer to XVIII – Eligibility Declarations and Annexure 6 of this tender document.

3.7 In case Integrity Pact is mandated in the NIT/SIT, only those bidders who sign the Integrity Pact, would be eligible to participate in the Tender.

3.8 Any bidder having a conflict of interest, which substantially affects fair competition, shall not be eligible to bid in this tender. Bids found to have a conflict of interest shall be rejected as nonresponsive. Bidder shall be required to declare the absence of such conflict of interest in Section XVIII Eligibility Declarations.

4. Eligible Goods Services - Country of Origin and Minimum Local Content

Unless otherwise stipulated in SCC or Contract, the country of origin of 'Goods' and 'incidental Works/ Service' to be supplied under the contract shall have their origin in India or other countries and must conform to the declaration made by the contractor in its bid regarding but not limited to i) restrictions on certain countries with land-borders with India; ii) minimum local content and location of value addition (Make in India Policy); iii)

Contractor's status as MSE or Start-up. The term "origin" used in this clause means where the goods (including subcontracted components) are mined, grown, produced, or manufactured or from where the incidental Works/ Services are arranged and supplied.

5. Tendering Expense

The tenderer shall bear all costs and expenditure incurred and / or to be incurred by it in connection with its tender including preparation, mailing and submission of its tender and for subsequent processing the same. BRBNMPL will, in no case be responsible or liable for any such cost, expenditure etc. regardless of the conduct or outcome of the tendering process.

B TENDER DOCUMENTS

6. Content of Tender Documents

6.1 The tender document includes: -

1. Section I : Notice Inviting Tender (NIT)
2. Section II : General Instructions to Tenderers (GIT)
3. Section III : Special Instructions to Tenderers (SIT)
4. Section IV : General Conditions of Contract (GCC)
5. Section V : Special Conditions of Contract (SCC)
6. Section VI : List of Requirements
7. Section VII : Technical Specifications/Scope of Work
8. Section VIII : Quality Control Requirements
9. Section IX : Qualification Criteria
10. Section X : Tender Form
11. Section XI : Price Schedule
12. Section XII : Bidder Information
13. Section XIII : Bank Guarantee Form for EMD
14. Section XIV : Manufacturer's Authorization Form
15. Section XV : Bank Guarantee Form for Performance Security
16. Section XVI : Contract Form
17. Section XVII : Letter of Authority for attending a Bid Opening
18. Section XVIII : Eligibility Declarations
19. Section XIX : Proforma of Bills for Payments
20. Section XX : Proforma for Pre-Contract Integrity Pact

6.2 The relevant details of the required goods and services, the terms, conditions and procedure for tendering, tender evaluation, placement of contract, the applicable contract terms and, also, the standard formats to be used for this purpose are incorporated in the above-mentioned documents. The interested tenderers before formulating the tender and submitting the same to BRBNMPL, should read and examine all the terms, conditions, instructions etc. contained in the tender documents. Failure to provide and / or comply with the required information, instructions etc. incorporated in these tender documents may result in rejection of its tender.

7. Amendments to Tender Documents

7.1 At any time prior to the deadline for submission of tenders, BRBNMPL may, for any reason deemed fit by it, modify the tender documents by issuing suitable amendments to it.

7.2 Such an amendment will be uploaded in the website and notified in writing by registered / speed post or by fax / telex / e-mail, followed by copy of the same by suitable recorded post to all prospective tenderers, which have received the tender documents and will be binding on them.

7.3 In order to provide reasonable time to the prospective tenderers to take necessary action in preparing their tenders as per the amendment, BRBNMPL may, at its discretion extend the deadline for the submission of tenders and other allied time frames, which are linked with that deadline.

8. Pre-Bid conference

8.1 If found necessary, a pre-bid conference may be stipulated in the SIT, for clarification / amendment to Technical specifications / techno-commercial conditions in two-bid tenders.

8.2 Participation is not mandatory, however, in case a bidder chooses not to participate (or fails to do so) in the pre-bid conference, it would be assumed that they have no issues regarding the Technical / commercial specifications / conditions.

8.3 After the pre-bid conference a clarification letter would be issued, containing amendments if required, of various provisions of the Bid-Document, which shall form part of the Bid-document.

9. Clarification of Tender Documents

Prospective bidders must interpret the provisions in the Bid document in the context in which they appear. Any interpretation of the provisions far removed from such context or any other contrived interpretation or interpretation between the lines is not acceptable. A Tenderer requiring any clarification or elucidation on any issue of the tender documents may take up the same with BRBNMPL in writing or by fax / e-mail / telex. BRBNMPL will respond in writing to such request provided the same is received by BRBNMPL prior to the prescribed date of submission of tender. Copies of the query and clarification shall be sent to all prospective bidders who have received the bidding documents.

C PREPARATION OF TENDERS

10. Documents Comprising the Tender

10.1 Unless otherwise indicated in NIT/SIT, **"Technical bid"** shall include inter-alia (including any changes in the following as per NIT/ SIT):

a) Tender Form/Covering letter as per format in Section X.

b) Section VI - List of Requirements, showing the schedules and quantities quoted.

c) Documentary evidence, as necessary in terms of GIT clauses 3 and 16 establishing that the tenderer is eligible to submit the tender and, also, qualified to perform the contract if its tender is accepted.

d) Documents and relevant details to establish in accordance with GIT clause 17 that the goods and the allied services to be supplied by the tenderer conform to the requirement of the tender documents along with list of deviations if any (ref clause 17.2 of GIT). The tenderers may also enclose in their tenders, technical literature and other documents as and if considered necessary by them.

e) Earnest money furnished in accordance with GIT clause 18.1 alternatively, documentary evidence as per GIT clause 18.2 for claiming exemption from payment of earnest money. and

f) Bidder Information as per Section XII.

g) Manufacturer's Authorization Form (ref Section XIV, if applicable)

h) A list of deviations (ref Clause 19.4) from the clauses of this SBD, if any.

i) If stipulated in NIT/SIT, duly signed Integrity Pact as per Section XX.

Note: No price details shall be disclosed or hinted upon in any manner in the Technical bid.

10.2 Unless otherwise indicated in NIT/ SIT, **"Financial Bid"** shall include inter-alia (including any changes in the following as per NIT/ SIT):

a) Price Schedule (Section XI) and all financially relevant details. Prices shall be quoted duly taking into consideration, the Payment and delivery terms.

Note: No additional Technical details, which have not been brought out in the Technical Bid, may be brought out in the Financial Bid.

10.3 A tender, that does not fulfil any of the above requirements and / or gives evasive information / reply against any such requirement, shall be liable to be ignored and rejected.

10.3 Tender sent by fax/email/telex/cable shall be ignored.

11. Tender currencies

11.1 Unless otherwise specified, the tenderer shall quote only in Indian rupees.

11.2 Where the tender condition specifies acceptance of quotations in different currencies, then, for domestic goods, prices shall be quoted in Indian rupees only and for imported goods, prices shall be quoted either in Indian rupees or in the currency stipulated in the SIT, mentioning, inter-alia, the exchange rate adopted for converting foreign currency into Indian Rupees. As regards price(s) for allied services, if any, required with the goods, the same shall be quoted in Indian Rupees if such services are to be performed / undertaken in India.

11.3 Tenders, where prices are quoted in any other way shall be treated as unresponsive and rejected.

12. Tender Prices

12.1 The Tenderer shall indicate on the Price Schedule provided under Section XI all the specified components of prices shown therein including the unit prices and total tender prices of the goods and services it proposes to supply against the requirement. All the columns shown in the price schedule should be filled up as required. If any column does not apply to a tenderer, same should

be clarified accordingly by the tenderer.

12.2 If there is more than one schedule in the List of Requirements, the tenderer has the option to submit its quotation for any one or more schedules and, also, to offer special discount for combined schedules. However, while quoting for a schedule, the tenderer shall quote for the complete requirement of goods and services as specified in that particular schedule.

12.3 The quoted prices for goods offered from within India (goods manufactured in India or goods of foreign origin already located in India) and that for goods of foreign origin offered from abroad are to be indicated separately in the applicable Price Schedules attached under Section XI.

12.4 While filling up the columns of the price schedule, the following aspects should be noted for compliance:

12.5 For goods offered from within India (goods manufactured in India or goods of foreign origin already located in India), the prices in the corresponding price schedule shall be entered separately in the following manner:

a) The price of the goods, quoted ex-factory, ex-showroom, ex-warehouse or off-the-shelf, as applicable, including Goods and services Tax, Customs duty or any other similar duties and taxes already paid or payable on the components and raw material used in the manufacture or assembly of the goods quoted ex-factory etc. or on the previously imported goods of foreign origin quoted ex-showroom etc.

b) Goods and Services Tax, which will be payable on the goods in India if the contract is awarded.

c) Charges towards inland transportation, insurance and other local costs incidental to delivery of the goods to their final destination as specified in the List of Requirements and

d) The price of incidental services, as and if mentioned in List of Requirements.

12.6 For goods of foreign origin offered from abroad, the prices in the corresponding price schedule shall be entered separately in the following manner:

a) The price of goods quoted FAS / FOB port of shipment, CIF port of entry in India or CIF specified place of destination in India as indicated in the List of Requirements,

b) Wherever applicable, the amount of custom duty and import duty on the goods to be imported.

c) The charges for inland transportation, insurance and other local costs incidental to delivery of the goods from the port of entry in India to their final destination, as specified in the List of Requirements. and

d) The charges for incidental services, as and if mentioned in the List of Requirements.

12.7 Additional information and instruction on Duties and Taxes: For goods offered from within India (goods manufactured in India or goods of foreign origin already located in India), if the Tenderer desires to ask for Goods and services Tax, Customs duty or any other similar duties and taxes to be paid extra, the same must be specifically stated. In the absence of any such stipulation the price will be taken inclusive of such duties and taxes and no claim for the same will be entertained later.

12.8 Goods and Services Tax

a) All the bidders/tenders should ensure that they are GST compliant and their quoted tax structure/rates are as per GST Law.

b) As per the GST Act, the bid and contract must show the GST Tax Rates (and GST Cess, if applicable) and GST Amount explicitly and separate from the bid/contract price (exclusive of GST). Bid-price inclusive of taxes/GST would be a violation of the GST Act. In case any taxes, duties are not clearly specified, or column is left blank in price bid then it will be presumed that no such tax/levy is applicable or payable by BRBNMPL. However, the price should be inclusive of any other taxes or levies if any, already paid or payable.

c) If a tenderer asks for GST (and GST Cess, if applicable) to be paid extra, the rate and nature of such taxes applicable should be shown separately. Such taxes will be paid as per the rate at which it is liable to be assessed or has actually been assessed provided the transaction of sale is legally liable to such taxes and is payable as per the terms of the contract. The payment of GST and GST Cess to contractor/supplier would be made only on the latter submitting a Bill/invoice in accordance with the provision of relevant GST Act and the rules made there under and after online filing of valid return on GST portal.

d) Bidders should quote 'GST' if payable extra on total basic rate of each item. GST in '%' inclusive of cess to be quoted. GST will be applicable on 'basic rate + Packing & forwarding charges + Freight + Insurance'.

e) **GST Registration Number (15-digit GSTIN):** In case bidder has multiple business verticals in a state and having separate registration for each business vertical, GSTIN of each vertical concerned with the supply and service involved, as per the scope of NIT to be informed to BRBNMPL. If supply / service provided is from multiple states, then bidder should mention GST Registration Number for each state separately.

f) If bidder is not liable to take GST registration, i.e., having turnover below threshold, bidders need to submit undertaking / indemnification against tax liability. The bidder/dealer shall not charge any GST and/or GST Compensation Cess on the bill/invoice. In such case, applicable GST will be deposited by BRBNMPL directly to concerned authorities. Further, the bidder should notify and submit to BRBNMPL within 15 days from the date of becoming liable to registration under GST.

g) Those bidders who have opted for Composition scheme under GST, they have to submit a declaration indicating their GST registration No.

h) **HSN (Harmonized System of Nomenclature) code** for the goods being supplied by the vendor for each item covered under the NIT has to be declared in the Technical bid. Services Accounting Code (SAC) for classification of services under GST for each item covered under the NIT has to be declared in the Technical bid.

i) All necessary adjustment vouchers such as Credit Notes / Debit Notes for any short/excess supplies or revision in prices or for any other reason under the Contract shall be submitted to BRBNMPL as per GST provisions.

j) In the event of default on his part in payment of tax and submission / uploading of monthly returns, BRBNMPL is well within its powers to withhold payments, especially the tax portion, until Vendor/Supplier/ Contractor corrects the default and / or complies with the requirements of GST and produces satisfactory evidence to that effect or upon GST appearing on the Company GST portal.

k) Vendor/Supplier/Contractor should issue Receipt vouchers immediately on receipt of advance payment and subsequently issue supplies along tax invoice after adjusting advance payments as per Contractual terms and GST Provisions.

l) In case the GST rating of vendor on the GST portal / Govt. official website is negative / blacklisted, then the bids may be rejected by BRBNMPL. Further, in case rating of bidder is negative / blacklisted after award of work for supply of goods / services, then BRBNMPL shall not be obligated or liable to pay or reimburse GST to such vendor and shall also be entitled to deduct / recover such GST along with all penalties / interest, if any, incurred by BRBNMPL.

m) Any late delivery i.e., delivery after the due date attracts payment of damages by the vendor / contractor as agreed mutually. It is agreed by the Contractor that such damages become recoverable by BRBNMPL with applicable GST thereon.

n) Any reference in the NIT to CENVAT / VAT / Service Tax / Excise Duty and the clauses relating thereto may please be ignored.

12.9 Goods and Services Tax…contd…

a) If reimbursement of Goods and Services Tax is intended as extra over the quoted prices, the supplier must specifically say so also indicating the rate, quantum and nature of the tax applicable. In the absence of any such stipulation, it will be presumed that the prices quoted are firm and final and no claim on account of Goods and Services Tax will be entertained after the opening of tenders.

b) If a Tenderer chooses to quote a price inclusive of Goods and Services Tax and also desires to be reimbursed for variation, if any, in the Goods and Services Tax during the time of supply, the tenderer must clearly mention the same and also indicate the rate and quantum of Goods and Services Tax included in its price. Failure to indicate all such details in clear terms may result in statutory variations being denied to the tenderer.

c) Subject to sub clauses (a) & (b) above, any change in Goods and Services Tax upward / downward as a result of any statutory variation in Goods and Services Tax taking place within original Delivery Period shall be allowed to the extent of actual quantum of Goods and Services Tax paid by the supplier. In case of downward revision in Goods and Services Tax, the actual quantum of reduction of Goods and Services Tax shall be reimbursed to BRBNMPL by the supplier. All such adjustments shall include all reliefs, exemptions, rebates, concession etc. if any obtained by the supplier.

d) If a tenderer asks for GST to be paid extra, the rate and nature of such taxes applicable should be shown separately. Such taxes will be paid as per the rate at which it is liable to be assessed or has actually been assessed provided the transaction of sale is legally liable to such taxes and is payable as per the terms of the contract.

e) The tenderer should quote the exact percentage of GST that they will be charging extra.

12.10 Duties, taxes and other levies of Local bodies

Unless otherwise stated in the SIT, the goods supplied against contracts placed by BRBNMPL are not exempted from levy of duties, taxes and other Levies of local bodies. In such cases, the supplier should make the payment to avoid delay in supplies and forward the receipt of the same to the purchasing department for reimbursement and, also, for further necessary action.

In cases where exemption is available, suppliers should obtain the exemption certificate from the purchasing department to avoid payment of such levies and taxes.

12.11 Duties / Taxes on Raw Materials

BRBNMPL is not liable for any claim from the supplier on account of fresh imposition and / or increase (including statutory increase) of Customs duty, Goods and Services Tax or any other similar duties and taxes on raw materials and/or components used directly in the manufacture of the contracted goods taking place during the pendency of the contract, unless such liability is specifically agreed to in terms of the contract.

12.12 Imported Stores not liable to Above-mentioned Taxes and Duties:

Above mentioned Taxes and Duties are not leviable on imported goods (goods of foreign origin offered from abroad) and hence would not be reimbursed.

12.13 Customs Duty:

In respect of imported goods of foreign origin offered from abroad, the tenderer shall specify the rate as well as the total amount of customs duty payable. The tenderer shall also indicate the corresponding Indian Customs Tariff Number applicable for the goods in question.

12.13.1 For transportation of imported goods offered from abroad, relevant instructions as incorporated under GCC Clause 11 shall be followed.

12.13.2 For insurance of goods to be supplied, relevant instructions as provided under GCC Clause 12 shall be followed.

12.13.3 Unless otherwise specifically indicated in this tender document, the terms FOB, FAS, CIF etc. for imported goods of foreign origin offered from abroad, shall be governed by the rules & regulations prescribed in the current edition of INCOTERMS, published by the International Chamber of Commerce, Paris

12.13.4 The need for indication of all such price components by the tenderers, as required in this clause (viz., GIT clause 12) is for the purpose of comparison of the tenders by BRBNMPL and will no way restrict BRBNMPL's right to award the contract on the selected tenderer on any of the terms offered.

13. Authorized Dealer/Distributor/Representative of Suppliers

(i) For Non-Commercially-Off-the-Shelf (Non-COTS) items, when a firm sends quotation for an item manufactured by some different company, the firm is also required to attach, in its quotation, the manufacturer's authorisation certificate and also manufacturer's confirmation of extending the required warranty for that product as per formats given in SBD. This is necessary to ensure quotation from a responsible party offering genuine product, also backed by a warranty obligation from the concerned manufacturer. In the tender, either the manufacturer/OEM or its authorised dealer/distributor/ representative can be considered as valid bidders.

(ii) In case of large contracts, especially capital equipment, the manufacturer's authorisation must be insisted upon on a tender specific basis, not general authorisation/dealership, by so declaring in the bid documents clearly.

(iii) In cases where the manufacturer has submitted the bid, the bids of its authorised dealer/ distributor/ representative will not be considered and EMD will be returned.

(iv) And in case of violations, both infringing bids will be rejected.

(v) For Commercially-Off-the-Shelf (COTS) items with clear and standard specifications, where the requirement is technically and commercially simple enough that pre-qualification of the bidder is not crucial for the performance of the contract, a valid dealership certificate will have to be submitted.

(vi) Bids of bidders quoting as authorised representative of a principal manufacturer would also be considered to be qualified, provided:

a) their principal manufacturer meets all the criteria above without exemption, and

b) the principal manufacturer furnishes a legally enforceable tender-specific authorisation in the prescribed form assuring full guarantee and warranty obligations as per the general and special conditions of contract; and

c) the bidder himself should have been associated, as authorised representative of the same or other Principal Manufacturer for same set of services as in present bid (supply, installation, satisfactorily commissioning, after sales service as the case may be) for same or similar 'Product' for past three years ending on 'The Relevant Date'.

13.1 Conflict of Interest among Bidders

A bidder shall not have any conflict of interest with other bidders. The bidder found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in the bidding process if,

(i) they have controlling partner(s) in common; or

(ii) they receive or have received any direct or indirect subsidy/financial stake from any of them; or

(iii) they have the same legal representative for purposes of the bid; or

(iv) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; or

(v) Bidder participates in more than one bid in the bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties involved. However, this does not limit the inclusion of the components/sub-assembly/ Assemblies from one bidding manufacturer in more than one bid; or

(vi) a Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid.

(vii) For same reasons, in case of a holding company having more than one independently manufacturing units or more than one unit having common business ownership / management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare in their bids such sister / common business / management units in same / similar line of business.

14. Firm Price / Variable Price

14.1 Unless otherwise specified in the SIT, prices quoted by the tenderer shall remain firm and fixed during the currency of the contract and not subject to variation on any account.

14.2 In case the tender documents require offers on variable price basis, the price quoted by the tenderers will be subject to adjustment during original Delivery Period to take care of the changes in the cost of labour and material components in accordance with the price variation formula to be specified in the SIT. If a tenderer submits firm price quotation against the requirement of variable price quotation, that tender will be prima-facie acceptable and considered further, taking price variation asked for by the tenderer as zero.

14.3 However, as regards taxes and duties, if any, chargeable on the goods and payable, the conditions stipulated in GIT clause 12 will apply for both firm price tender and variable price tender.

14.4 Subject to provisions of Clause 11 above, where prices are quoted in foreign currencies, involving imports - Foreign Exchange Rate

Variation (ERV) would be borne by the Purchaser within the original Delivery Period. The offer of the Tenderer should indicate import content and the currency used for calculating import content.

14.5 Base Exchange rate of each major currency used for calculating FE content of the contract should be indicated. The base date of ERV would be contract date and variation on the base date can be given up to the midpoint manufacture, unless firm has already indicated the time schedule within which material will be imported by the firm.

14.6 In case delivery period is re-fixed / extended, ERV will not be admissible, if this is due to default of the supplier.

14.7 Documents for claiming ERV:

(i) A bill of ERV claim enclosing working sheet

(i) Banker's Certificate/debit advice detailing FE paid and exchange rate

(ii) Copies of import order placed on supplier

(iii) Invoice of supplier for the relevant import order

15. Alternative Tenders

Unless otherwise specified in the Schedule of Requirements, alternative tenders shall not be considered.

16. Documents Establishing Tenderer's Eligibility and Qualifications

16.1 Pursuant to GIT clause 3 and 10, the tenderer shall furnish, as part of its tender, relevant details and documents establishing its eligibility to quote and its qualifications to perform the contract if its tender is accepted.

16.2 The documentary evidence needed to establish the tenderer's qualifications shall fulfil the following requirements:

a) In case the tenderer offers to supply goods, which are manufactured by some other firm, the tenderer has been duly authorized by the goods manufacturer to quote for and supply the goods to BRBNMPL. The tenderer shall submit the Manufacturer's Authorization Letter to this effect as per the standard form provided under Section XIV in this document.

b) The tenderer has the required financial, technical and production capability necessary to perform the contract and, further, it meets the qualification criteria incorporated in the Section IX in these documents.

c) In case the tenderer is not doing business in India, how will he be able to carry out the required contractual functions and duties of the supplier including after sale service, maintenance & repair etc. of the goods in question, stocking of spare parts and fast-moving components and other obligations, if any, specified in the conditions of contract and/or technical specifications.

17. Documents establishing Good's Conformity to Tender document

17.1 **Country of Origin, Manufacture and Supply:** Bidder must declare the country of - origin, manufacture, value addition and supply of the goods offered by them. He must confirm that these do not violate provisions of Clause 3 of GIT.

17.2 The tenderer shall provide in its tender the required as well as the relevant documents like technical data, literature, drawings etc. to establish that the goods and services offered in the tender fully conform to the goods and services specified by BRBNMPL in the tender documents. For this purpose, the tenderer shall also provide a clause-by-clause commentary on the technical specifications and other technical details incorporated by BRBNMPL in the tender documents to establish technical responsiveness of the goods and services offered in its tender.

17.3 In case there is any variation and/or deviation between the goods & services prescribed by BRBNMPL and that offered by the tenderer, the tenderer shall list out the same in a chart form without ambiguity along with justification, and provide the same along with its tender.

17.4 If a tenderer furnishes wrong and/or misguiding data, statement(s) etc. about technical acceptability of the goods and services offered by it, its tender will be liable to be ignored and rejected in addition to other remedies available to BRBNMPL in this regard.

18. Earnest Money Deposit (EMD)

18.1 Pursuant to GIT clause 10.1(e) the tenderer shall furnish along with its tender, earnest money for amount as shown in the List of Requirements. The earnest money is required to protect BRBNMPL against the risk of the Tenderer's unwarranted conduct as amplified under sub-clause 23.2 below.

18.2 The tenderers who are currently registered and, also, will continue to remain registered during the tender validity period with BRBNMPL (except for NCB/ICB Tender) or as a Micro and Small Enterprise (MSE) as defined in MSEs Order 2012 issued by Ministry of Micro, Small and Medium Enterprises (MoMSME) or as a Startup as recognised by Department for Promotion of Industry and Internal Trade (DPIIT), are exempted from payment of earnest money. In case the tenderer falls in these categories, it should furnish certified copy of its valid registration details (registration with BRBNMPL or as a MSE or as a Startup, as the case may be).

Micro & Small Enterprises must attach Registration Certificate issued by DIC / KVIC / KVIB / Coir Board / NSIC / Directorate of Handicrafts and Handlooms, or any other body specified by MSME for authentication such as Udyog Aadhaar Memorandum / Acknowledgment / Udyog Aadhaar Portal / Udyam Registration.

18.3 The earnest money shall be denominated in Indian Rupees or in equivalent foreign exchange in case of GTE/ICB tenders.

18.4 The earnest money shall be furnished in one of the following forms:

a) Insurance Surety Bonds

b) Account Payee Demand Draft from any scheduled commercial bank in India or

c) Banker's cheque from any scheduled commercial bank in India or

d) Online Bank Transfer (Proof of online transfer to be submitted)

e) Other Electronic Modes of Payment

- Debit Card powered by RuPay
- Unified Payments Interface (UPI) (BHIM-UPI)
- Unified Payments Interface Quick Response Code (UPI QR Code) (BHIM-UPI QR Code)

f) Bank Guarantee (including e-Bank Guarantee) issued/confirmed by any scheduled commercial bank in India in the proforma given in Section XIII of SBD in case the amount is more than ₹5 lakh and in case of foreign bidders in GTE/ICB tenders (in equivalent foreign exchange amount)

18.5 Unless otherwise specified in SIT, the earnest money shall be valid for a period of forty-five days beyond the validity period of the tender.

18.6 In case of two packet or two stage bidding, EMD of unsuccessful bidders during the first stage i.e. technical evaluation etc. should be returned to them without any interest whatsoever within 30 days of declaration of result of the first stage i.e. technical evaluation etc.

Otherwise, EMD of the unsuccessful bidders should be returned to them at the earliest after expiry of the final bid validity and latest on or before the 30th day after the award of the contract.

The successful bidder's bid security (EMD) can be adjusted against the SD or returned as per the terms of the tender document. The balance can be deducted from the supplier's bill/invoice before release of payment. Unlike Procurement of Works, in Procurement of Goods, the concept of taking part of Performance Guarantee as money retained from first or progressive bills of the supplier is not acceptable.

18.7 Earnest money of a tenderer will be forfeited, if the tenderer withdraws or amends its tender or impairs or derogates from the tender in any respect within the period of validity of its tender. The successful tenderer's earnest money will be forfeited if it fails to furnish the required performance security within the specified period.

19. Tender Validity

19.1 If not mentioned otherwise in the SIT, the tenders shall remain valid for acceptance for a period of 90 days (Ninety days) in case of single bid tender system and 120 days in case of two-bid system after the date of tender opening prescribed in the tender document. Any tender valid for a shorter period shall be treated as unresponsive and rejected.

19.2 In exceptional cases, the tenderers may be requested by BRBNMPL to extend the validity of their tenders up to a specified period. Such request(s) and responses thereto shall be conveyed by surface mail or by fax/email/ telex/cable followed by surface mail. The tenderers, who agree to extend the tender validity, are to extend the same without any change or modification of their

original tender and they are also to extend the validity period of the EMD accordingly.

19.3 In case the day up to which the tenders are to remain valid falls on/ subsequently declared a holiday or closed day for BRBNMPL, the tender validity shall automatically be extended up to the next working day.

19.4 **Compliance with the Clauses of this Tender Document:** Tenderer must comply with all the clauses of this Tender Document. In case there are any deviations, these should be listed in a chart form without any ambiguity along with justification.

20. Signing and Sealing of Tender

20.1 An authenticated copy of the document which authorizes the signatory to commit on behalf of the firm shall accompany the offer. The individual signing the tender or any other documents connected therewith should clearly indicate his full name and designation and also specify whether he is signing,

(a) As Sole Proprietor of the concern or as attorney of the Sole Proprietor;

(b) As Partner (s) of the firm;

(c) As Director, Manager or Secretary in case the of Limited Company duly authorized by a resolution passed by the Board of Directors or in pursuance of the Authority conferred by Memorandum of Association.

20.2 The authorized signatory of the tenderer must sign the tender at appropriate places and initial the remaining pages of the tender.

20.3 The tenderers shall submit their tenders as per the instructions contained in GIT Clause 10.

20.4 Unless otherwise mentioned in the SIT, a tenderer shall submit the tender in "Original" and in "Duplicate" and mark them as such.

20.5 The original and other copies of the tender shall either be typed or written in indelible ink and the same shall be signed by the tenderer or by a person(s) who has been duly authorized to bind the tenderer to the contract. The letter of authorization shall be by a written power of attorney, which shall also be furnished along with the tender.

20.6 All the copies of the tender shall be duly signed at the appropriate places as indicated in the tender documents and all other pages of the tender including printed literature, if any shall be initialled by the same person(s) signing the tender. The tender shall not contain any erasure or overwriting, except as necessary to correct any error made by the tenderer and, if there is any such correction; the same shall be initialled by the person(s) signing the tender.

20.7 The tenderer is to seal the original and each copy of the tender in separate envelopes, duly marking the same as "Original", "Duplicate" and so on and writing the address of BRBNMPL and the tender reference number on the envelopes. The sentence "NOT TO BE OPENED" before … (The tenderer is to put the date & time of tender opening) are to be written on these envelopes. The inner envelopes are then to be put in a bigger outer envelope, which will also be duly sealed, marked etc. as above. If the outer envelope is not sealed and marked properly as above, BRBNMPL will not assume any responsibility for its misplacement, premature opening, late opening etc.

20.8 **Two-Bid (envelop/packet) System:** If so indicated in the NIT/SIT, tender document will seek quotation in two parts (Two Bid System) for purchasing capital equipment, high value plant, machinery etc. of complex and technical nature. First part would be containing the relevant technical details of the equipment / machinery etc., and in the second part, price quotation along with other allied issues. First part will be known as 'Technical Bid', and the second part 'Financial bid'. Tenderer shall seal separately 'Technical Bid' and 'Financial bid' and covers will be suitably super scribed. Both these sealed covers shall be put in a bigger cover and sealed and evaluation would be done as described in clause 24.4 below. Further details would be given in SIT, if considered necessary. Pricing details should not be mentioned or hinted at in any manner in the "Technical Bid". In Financial bid, there should not be any extra information connected with Technical suitability of the offer – which has not been already disclosed in the Technical Bid.

20.9 Documents to be uploaded in case of e-tenders

20.9.1 Documents that need *not* be signed or uploaded by Bidders

Unless otherwise stipulated, the following sections & annexures of the tender document need not be signed and uploaded as part of the Bid. However, Bidders have to upload 'Terms and Conditions – Compliance' as token of acceptance of all the Terms and Conditions mentioned therein.

1. Section I : Notice Inviting Tender (NIT)
2. Section II : General Instructions to Tenderers (GIT)
3. Section III : Special Instructions to Tenderers (SIT)
4. Section IV : General Conditions of Contract (GCC)
5. Section V : Special Conditions of Contract (SCC)
6. Section VI : List of Requirements
7. Section VII : Technical Specifications/Scope of Work
8. Section VIII : Quality Control Requirements
9. Section IX : Qualification Criteria
10. Section XIII : Bank Guarantee Form for EMD
11. Section XV : Bank Guarantee Form for Performance Security
12. Section XVI : Contract Form
13. Section XIX : Proforma of Bills for Payments
14. Annexure 1 to 5 : Explanatory Note on Make in India Order 2017; MSEs Order 2012 and Start-ups
15. Annexure 6 : Restrictions on Public Procurement from countries sharing land border with India

20.9.2 Documents that need to be filled, digitally signed and uploaded by Bidders

Unless otherwise stipulated, the following sections & annexures need to be filled, digitally signed and uploaded as part of the Bid: -

1. List of Requirements – Compliance
2. Technical Specifications – Compliance
3. Quality Control Requirements – Compliance
4. Section X : Tender Form (To serve as a covering letter to both the Techno-commercial & Financial Bids)
5. Section XI : Price Schedule
6. Section XII : Bidder Information
7. Section XIV : Manufacturer's Authorization Form, if applicable
8. Section XVII : Letter of Authority for attending a Bid Opening
9. Section XVIII : Eligibility Declarations
10. Section XX : Proforma for Pre-Contract Integrity Pact, if applicable
11. Annexure 7 : Bid Securing Declaration (for exempted bidders)
12. Annexure 8 : Assessment of capability of Bidder, if asked
13. Annexure 9 : Performance Statement
14. Annexure 10 : Statement of Financial Standing, if required
15. Annexure 11 : NEFT Mandate Form
16. Annexure 12 : Terms and Conditions – Compliance
17. Annexure 13 : Undertaking to provide financial support to our wholly owned subsidiary
18. Annexure 14 : Checklist for Bidders

D SUBMISSION OF TENDERS

21. Submission of Tenders

21.1 Tenderers shall ensure that their tenders, duly sealed and signed, complete in all respects as per instructions contained in the Tender Documents, are dropped in the tender box located at the place as indicated in NIT on or before the closing date and time indicated therein, failing which the tenders will be treated as late and rejected. Tenders may also be sent through post at the address as above. However, Purchaser will not be responsible for any postal lapses or delays in receipt of the documents. In case of bulky tender, which cannot be put into tender box, the same shall be submitted by the tenderer by hand to the designated officers of BRBNMPL, as indicated in NIT. The officer receiving the tender will give the tenderer an official receipt duly signed with date and time.

21.2 The tenderers must ensure that they deposit their tenders not later than the closing time and date specified for submission of tenders. In the event of the specified date for submission of tender falls on / is subsequently declared a holiday or closed day for BRBNMPL, the tenders will be received up to the appointed time on the next working day.

22. Late Tender

A tender, which is received after the specified date and time for receipt of tenders will be treated as "late" tender and will be ignored.

23. Alteration and Withdrawal of Tender

23.1 The tenderer, after submitting its tender, is permitted to alter / modify its tender so long as such alterations / modifications are received duly signed, sealed and marked like the original tender, within the deadline for submission of tenders. Alterations / modifications to tenders received after the prescribed deadline will not be considered.

23.2 No tender should be withdrawn after the deadline for submission of tender and before expiry of the tender validity period. If a tenderer withdraws the tender during this period, it will result in forfeiture of the earnest money furnished by the tenderer in its tender besides other sanctions by BRBNMPL.

E TENDER OPENING

24. Opening of Tenders

24.1 BRBNMPL will open the tenders at the specified date and time and at the specified place as indicated in clause 1 of NIT. In case the specified date of tender opening falls on / is subsequently declared a holiday or closed day for BRBNMPL, the tenders will be opened at the appointed time and place on the next working day.

24.2 Authorized representatives of the tenderers, who have submitted tenders on time may attend the tender opening, provided they bring with them letters of authority as per the format in SBD XVII from the corresponding tenderers. The tender opening official(s) will prepare a list of the representatives attending the tender opening. The list will contain the representatives' names & signatures and corresponding tenderers' names and addresses.

24.3 During the tender opening, the tender opening official(s) will read the salient features of the tenders like description of the goods offered, price, special discount if any, delivery period, whether earnest money furnished or not and any other special features of the tenders, as deemed fit by the tender opening official(s).

24.4 In the case of two bid system mentioned in clause 20.8 above, the technical bids are to be opened in the first instance, at the prescribed time and date. These bids shall be scrutinized and evaluated by the competent committee / authority with reference to parameters prescribed in the tender document. Thereafter, in the second stage, the financial bids of only the technically acceptable offers (as decided in the first stage) shall be opened for further scrutiny and evaluation. Other financial bids would be returned unopened to the respective bidders under Registered AD / Reliable Courier or any other mode with proof of delivery.

F SCRUTINY AND EVALUATION OF TENDERS

25. Basic Principle

Tenders will be evaluated on the basis of the terms & conditions already incorporated in the tender document, based on which tenders have been received and the terms, conditions etc. mentioned by the tenderers in their tenders. No new condition will be brought in while scrutinizing and evaluating the tenders.

26. Preliminary Scrutiny of Tenders

26.1 The tenders will first be scrutinized to determine whether they are complete and meet the essential and important requirements, conditions etc. as prescribed in the tender document, the tenders, that do not meet the basic requirements, are liable to be treated as unresponsive and ignored.

26.2 The following are some of the important aspects, for which a tender may be declared unresponsive and ignored;

a) Tender is not in the prescribed format or is unsigned or not signed as per the stipulations in the bid document;

b) Tenderer is not eligible to participate in the bid as per laid down eligibility criteria (Example: the tender enquiry condition says that the bidder has to be a registered MSE unit, but the tenderer is a, say, a large-scale unit);

c) Tender validity is shorter than the required period;

d) Required EMD has not been provided or EMD provided is not as per prescribed format, amount, validity etc. or exemption from EMD is claimed without acceptable proof of exemption;

e) Tenderer has quoted for goods manufactured by a different firm without the required authority letter from that manufacturer;

f) Goods offered are sub-standard, not meeting the required specification etc.;

g) Tenderer has not agreed to essential condition(s) specified in the tender enquiry (Example: Some such important essential conditions are – performance security, terms of payment, liquidated damage clause, warranty clause, dispute resolution mechanism, applicable law and any other important condition having significant bearing on the cost/ utility/ performance of the required goods, etc.);

h) Against a schedule in the List of Requirement (incorporated in the tender enquiry), the Tenderer has not quoted for the entire requirement as specified in that schedule. (Example: In a schedule, it has been stipulated that the Tenderer will supply the equipment, install and commission it and also train BRBNMPL 's operators for operating the equipment. The Tenderer has however, quoted only for supply of the equipment).

27. Minor Infirmity / Irregularity / Non-Conformity

If during the preliminary examination, BRBNMPL find any minor infirmity and / or irregularity and / or non-conformity in a tender, BRBNMPL may waive the same provided it does not constitute any material deviation and financial impact and, also, does not prejudice or affect the ranking order of the tenderers. Wherever necessary, BRBNMPL will convey its observation on such 'minor' issues to the tenderer by registered post/speed post/email etc. asking the tenderer to respond by a specified date. If the tenderer does not reply by the specified date or gives evasive reply without clarifying the point at issue in clear terms, that tender will be liable to be ignored.

28. Discrepancy in Prices

28.1 If, in the price structure quoted by a tenderer, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless BRBNMPL feels that the tenderer has made a mistake in placing the decimal point in the unit price, in which case the total price as quoted shall prevail over the unit price and the unit price corrected accordingly.

28.2 If there is an error in a total price, which has been worked out through addition and / or subtraction of subtotals, the subtotals shall prevail and the total corrected; and

28.3 If there is a discrepancy between the amount expressed in words and figures, the amount in words shall prevail, subject to sub clause 28.1 and 28.2 above.

28.4 If, as per the judgment of BRBNMPL, there is any such arithmetical discrepancy in a tender, the same will be suitably conveyed to the tenderer by registered / speed post. If the tenderer does not agree to the observation of BRBNMPL, the tender is liable to be ignored.

29. Discrepancy between original and copies of Tender

In case any discrepancy is observed between the text etc. of the original and that of other copies of the same tender set, the text etc. of the original shall prevail. Here also, BRBNMPL will convey its observation suitably to the tenderer by registered / Speed post and, if the tenderer does not accept BRBNMPL's observation, that tender will be liable to be ignored.

30. Clarification of Bids

(i) During the evaluation of Techno commercial or Financial Bids, the Procuring Entity may, at its discretion, but without any obligation to do so, ask Bidder to clarify its bid by a specified date. Bidder should answer the clarification within that specified date (or, if not specified, 7 days from the date of receipt of such request). The request for clarification shall be submitted in writing or electronically, and no change in prices or substance of the bid shall be sought, offered, or permitted that may grant any undue advantage to such bidder. Any clarification submitted by a Bidder regarding its Bid that is not in response to a request by the Purchasing Entity shall not be considered.

(ii) In e-tendering, if discrepancies exist between the uploaded scanned copies and the Originals submitted by the bidder, the original copy's text, etc., shall prevail. Any substantive discrepancy shall be construed as a violation of the Code of Ethics, and the bid shall be liable to be rejected as non-responsive in addition to other punitive actions under the Tender Document for violation of the Code of Ethics.

(iii) The Procuring Entity reserves its right to, but without any obligation to do so, to seek any shortfall information / documents only in case of historical documents which pre-existed at the time of the Bid Opening, and which have not undergone change since then and does not grant any undue advantage to any bidder.

These should be called only on basis of the recommendations of the TEC.

31. Qualification and Eligibility Criteria

Tenders of the tenderers, who do not meet the required qualification and eligibility criteria prescribed in Section IX and Section XVIII respectively, will be treated as unresponsive and will not be considered further.

32. Conversion of tender currencies to Indian Rupees

In case the tender document permits the tenderers to quote their prices in different currencies, all such quoted prices of the responsive tenderers will be converted to a single currency viz., Indian Rupees for the purpose of equitable comparison and evaluation, as per the Bill Currency Selling exchange rates established by the State Bank of India for similar transactions, as on the date of tender opening.

33. Schedule-wise Evaluation

In case the List of Requirements contains more than one schedule, the responsive tenders will be evaluated and compared separately for each schedule. The tender for a schedule will not be considered if the complete requirements prescribed in that schedule are not included in the tender. However, as already mentioned in GIT sub clause 12.2, tenderers have the option to quote for any one or more schedules and offer discounts for combined schedules. Such discounts, wherever applicable, will be taken into account to determine the tender or combination of tenders offering the lowest evaluated cost for BRBNMPL in deciding the successful tenderer for each schedule, subject to that tenderer(s) being responsive.

34. Comparison on CIF/FOR Destination Basis

Unless mentioned otherwise in Section - III - Special Instructions to Tenderers and Section - VI - List of Requirements, the comparison of the responsive tenders shall be on CIF/FOR destination basis, duly delivered, commissioned, etc. as the case may be.

35. Additional Factors and Parameters for Evaluation and Ranking of Responsive Tenders

35.1 Further to GIT Clause 33 above, BRBNMPL's evaluation of a tender will include and take into account the following:

a) In the case of goods offered from within India (goods manufactured in India or goods of foreign origin already located in India), Goods and Services Tax or any other similar duties and taxes, which will be contractually payable (to the tenderer), on the goods if a contract is awarded on the tenderer; and

b) In the case of goods of foreign origin offered from abroad, customs duty and other similar import duties/taxes, which will be contractually payable (to the tenderer) on the goods if the contract is awarded on the tenderer.

35.2 BRBNMPL's evaluation of tender will also take into account the additional factors, if any, incorporated in SIT in the manner and to the extent indicated therein.

35.3 BRBNMPL reserves its right to grant preferences to eligible bidders under various Government Policies/directives (policies relating to Make in India; MSME; Start-ups etc.):

(i) Class I Local Suppliers under Public Procurement (Preference to Make in India) Order 2017 (MII) of Department for Promotion of Industry and Internal Trade, (DPIIT - Public Procurement Section) as revised from time to time. Please refer to Annexure 1 of this SBD.

(ii) Bidders from Micro and/or Small Enterprises (MSEs) under Public Procurement Policy for the Micro and Small Enterprises (MSEs) Order, 2012 as amended from time to time. Please refer to Annexure 3 of this SBD.

(iii) Start-ups Bidders under Ministry of Finance, Department of Expenditure, Public Procurement Division OM No F.20/2/2014-PPD dated 25.07.2016 and subsequent clarifications. Please refer to Annexure 4 of this SBD.

(iv) Any other category of Bidders, as per any Government Policies, announced from time to time, if so provided in this tender.

35.4 If the tenders have been invited on variable price basis, the tenders will be evaluated, compared and ranked on the basis of the position as prevailing on the day of tender opening and not on the basis of any future date.

36. Tenderer's capability to perform the contract

36.1 BRBNMPL, through the above process of tender scrutiny and tender evaluation will determine to its satisfaction whether the tenderer, whose tender has been determined as the lowest evaluated responsive tender is eligible, qualified and capable in all respects to perform the contract satisfactorily. If, there is more than one schedule in the List of Requirements, then, such determination will be made separately for each schedule.

36.2 The above-mentioned determination will, inter-alia, take into account the tenderer's financial, technical and production capabilities for satisfying all the requirements of BRBNMPL as incorporated in the tender document. Such determination will be based upon scrutiny and examination of all relevant data and details submitted by the tenderer in its tender as well as such other allied information as deemed appropriate by BRBNMPL.

36.3 **Consideration of Abnormally Low Bids:** An Abnormally Low bid is one in which the bid price, in combination with other elements of the bid, appears so low that it raises substantive concerns as to the Bidder's capability to perform the contract at the offered price. Procuring Entity shall in such cases seek written clarifications from the Bidder, including detailed price analyses of its bid price concerning scope, schedule, allocation of risks and responsibilities, and any other requirements of the Tender Document. If, after evaluating the price analyses, procuring entity determines that Bidder has substantively failed to demonstrate its capability to deliver the contract at the offered price, the Procuring Entity shall reject the bid/proposal, and evaluation shall proceed with the next ranked bidder.

37. Cartel Formation / Pool Rates

Cartel formation or quotation of Pool / Co-ordinated rates, leading to "Appreciable Adverse Effect on Competition" (AAEC) as identified in Competition Act, 2002, as amended by Competition (Amendment) Act, 2007, would be considered as a serious misdemeanour and would be dealt accordingly as per Clause 44 below.

38. Negotiations

Normally there would be no price negotiations. But BRBNMPL reserves its right to negotiate with the lowest acceptable bidder (L1), who is techno-commercially cleared / approved for supply of bulk quantity and on whom the contract would have been placed but for the decision to negotiate, under special circumstances in accordance with CVC guidelines. Selection of contractors by negotiations should be a rare exception rather than the rule and may be resorted to only in the following exceptional circumstances: -

(i) Where the procurement is done on nomination basis (PAC and STE without PAC);

(ii) Procurement is from a single or limited sources of supply;

(iii) Procurements where there is suspicion of cartel formation.

39. Contacting BRBNMPL

39.1. From the time of submission of tender to the time of awarding the contract, if a tenderer needs to contact BRBNMPL for any reason relating to this tender enquiry and / or its tender, it should do so only in writing.

39.2. It will be treated as a serious misdemeanour in case a tenderer attempts to influence BRBNMPL's decision on scrutiny, comparison, evaluation and award of the contracts. In such a case the tender of the tenderer shall be liable for rejection in addition to appropriate administrative actions being taken against that tenderer, as deemed fit by BRBNMPL, in terms of clause 44 of GIT.

G AWARD OF CONTRACT

40. BRBNMPL's Right to Accept any Tender and to Reject any or all Tenders

BRBNMPL reserves the right to accept in part or in full any tender or reject any tender without assigning any reason or to cancel the tendering process and reject all tenders at any time prior to award of contract, without incurring any liability, whatsoever to the affected tenderer or tenderers.

41. Award Criteria

Subject to GIT clause 36 above, the contract will be awarded to the lowest evaluated responsive tenderer decided by BRBNMPL in terms of GIT Clause 34.

42. Variation of Quantities at the Time of Award

Normally, there will be no variation of quantities at the time of awarding the contract. However, at the time of awarding the contract, the quantity to be procured shall be re-judged based on

the current data, since the ground situation may have very well changed. In that case, BRBNMPL reserves the right to increase or decrease the tendered quantity by 25 (Twenty-Five) per cent for ordering, if so warranted. A clause would be included in SIT giving further details.

43. Parallel Contracts

BRBNMPL reserves its right to conclude Parallel contracts, with more than one bidder (for the same tender) under following circumstances: -

(i) After due processing, if it is discovered that the quantity to be ordered is far more than what L-1 alone is capable of supplying and there was no prior stipulation in the NIT/ SIT to split the quantities, then the purchaser reserves its rights to distribute the quantity being finally ordered, among the other bidders by counter offering the L1 rate to L2 or higher tenderers.

(ii) When it is decided in advance to have more than one source of supply due to the critical / strategic / specific nature of the supplies / goods parallel contract stipulation would be declared in the NIT / SIT, clearly stating the manner of deciding relative share of lowest bidder (L1) contractor and the rest of the tenderers should be clearly defined, along with the minimum number of suppliers sought for the contract. Unless otherwise stipulated in the NIT / SIT, in case of splitting in two and three, the ratio of 70:30; 50:30:20, respectively, may be used. These ratios are approximate and BRBNMPL reserves its right to marginally vary quantities to suit capacity of the firm / unit loads of packing or transportation. In such cases the firms should not quote for less than 30% of the tendered quantity; otherwise, their offer would be considered as unresponsive.

44. Serious Misdemeanours and Integrity Pact

44.1 Serious Misdemeanour: Following would be considered as serious misdemeanours:

(i) Other than in situations of force majeure, after opening of financial bids, the supplier withdraws from the procurement process or after being declared as successful bidder: (i) withdraws from the process; (ii) fails to enter into a procurement contract; or (iii) fails to provide performance security or any other document or security required in terms of the bidding documents.

(ii) If the proprietor of the firm, its employee, partner, or representative is convicted of any offence by a court under the Prevention of Corruption Act, 1988 or under the Indian Penal Code or any other law for the time being in force for offences involving moral turpitude in business dealings.

(iii) If a firm directly or through an agent violates the code of ethics mentioned in Clause 32 of the GCC or violates Integrity Pact mentioned in clause 43.3 below, in procurement or execution of the contract.

(iv) Violate the safety or statutory norms that result in industrial accidents leading to loss or injury to life or property or to any other legal liability to The Procuring Entity.

(v) Employs an Ex-BRBNMPL official, who has been dismissed or removed on account of corruption or employs a non-official convicted for an offence involving corruption or abetment of such an offence, in a position where he could corrupt BRBNMPL officials or employs an Ex-BRBNMPL official within two years of his retirement, who has had business dealings with him in an official capacity before retirement; or

(vi) On account of doubtful loyalty to the country or national security consideration as determined by appropriate agencies of GoI (normally such banning/ blacklisting would be initiated by the central government/ ministry).

44.2 Besides, suitable administrative actions, like rejecting the offers or delisting of registered firms, BRBNMPL would take other remedies available to it including banning / blacklisting Tenderers committing such misdemeanour, including declaring them ineligible to be awarded BRBNMPL contracts for indefinite or for a stated period.

44.3 Integrity Pact

(i) **Signing of the Integrity Pact:** If so stipulated in the NIT/ SIT, purchaser shall be entering into an Integrity Pact with the bidders as per format enclosed vide Section XX: Integrity Pact, of this tender document. Each page of this Integrity pact proforma would be duly signed by Purchaser's competent signatory. All pages of the Integrity Pact are to be returned by the bidder (along with the technical bid) duly signed by the same signatory who signed the bid, i.e., who is duly authorized to sign the bid and to make binding commitments on behalf of his company. Any bid not accompanied by Integrity Pact duly signed by the bidder shall be considered to be a non-responsive bid and shall be rejected straightway. Names and contact details of the Independent Monitor(s) for this Tender are listed in Notice Inviting Tender (NIT).

(ii) **Additional Serious Misdemeanour:** As supplement to clause 44.1 above, breaches of any of the provisions of the Integrity Pact by the Bidder or anyone employed by it or acting on its behalf (whether with or without the knowledge of the Bidder) shall be one of the misdemeanours attracting consequences and penalties as mentioned in clause 44.2 above.

45. Notification of Award of Contract (Letter of Intent)

45.1 Before expiry of the tender validity period, BRBNMPL will notify the successful tenderer(s) in writing, by registered letter / speed post / courier or by fax / email (to be subsequently confirmed by registered letter / speed post / courier) that its tender for goods & services, which have been selected by BRBNMPL, has been accepted, also briefly indicating therein the essential details like description, specification and quantity of the goods & services and corresponding prices accepted. The successful tenderer must furnish to BRBNMPL the required performance security within twenty-one days from the date of this notification. Relevant details about the performance security have been provided under GCC Clause 6 under Section IV.

45.2 The notification of award shall constitute the conclusion of the contract.

46. Issue of Contract

46.1 Within seven working days of receipt of performance security, BRBNMPL will send the contract form (as per Section XVI), duly completed and signed in duplicate, to the successful tenderer by registered letter / speed post / courier.

46.2 Within seven days from the date of issue of the contract, the successful tenderer will return the original copy of the contract, duly signed and dated, to BRBNMPL by registered letter / speed post / courier.

47. Non-receipt of Performance Security and Contract by BRBNMPL

Failure of the successful tenderer in providing performance security within 21 days of receipt of notification of award and / or returning contract copy duly signed within stipulated time shall make the tenderer liable for annulment of the award and forfeiture of its EMD (or enforcement of Bid Securing Declaration), besides taking other administrative punitive actions by BRBNMPL against it.

48. Return of EMD

The earnest money of the successful tenderer and the unsuccessful tenderers will be returned to them without any interest, whatsoever, in terms of GIT Clause 18.6.

49. Publication of Tender Result

The name and address of the successful tenderer(s) receiving the contract(s) will be mentioned in the notice board/bulletin/web site of BRBNMPL.

Part II: Additional General Instructions Applicable to Specific Types of Tenders:

50. Rate Contract Tenders

50.1 If tender/contract stipulates explicitly that this is a "Rate Contract" for the supply of the Goods during the period therein specified, then the following additional Contract Conditions shall be applicable:

(i) Earnest Money Deposit (EMD) is to be furnished by unregistered bidders only.

(ii) The Rate Contract is only a standing offer from the Contractor. In the Schedule of Requirement, no commitment is given as to the number or quantity of the Goods which shall be ordered during the period of the rate contract; only the anticipated requirement is mentioned without any commitment.

(iii) The Procuring Entity undertakes to place the supply (withdrawal/off-take) orders for Goods detailed in the Contract at the terms and prices mentioned therein.

(iv) BRBNMPL reserves the right to conclude more than one rate

contract for the same item.

(v) Unless otherwise specified in SIT, the currency of a Rate Contract would normally be for one year.

(vi) During the currency of the Rate Contract, BRBNMPL would have the option to short-close the rate contract by serving suitable notice. The prescribed notice period is generally thirty days.

(vii) During the currency of the Rate Contract, BRBNMPL would have the option to renegotiate the price with the rate contract holders.

(viii) During the currency of the Rate Contract, in case of emergency or for values less than ₹2.5 lakh, BRBNMPL may purchase the same item through ad hoc contract with a new supplier.

(ix) Usually, the terms of delivery in rate contracts are FOR dispatching station.

(x) Supply orders, incorporating definite quantity of goods to be supplied along with all other required conditions following the rate contract terms, will be issued by BRBNMPL or its nominated Direct Demanding Officers (DDO) for obtaining supplies through the rate contract.

(xi) BRBNMPL is entitled to place supply orders up to the last day of the validity of the rate contract and, though supplies against such supply orders will be affected beyond the validity period of the rate contract, all such supply will be guided by the terms & conditions of the rate contract.

(xii) The rate contract will be guided by "Fall Clause" as described below.

50.2 Fall Clause

GCC clause 30 shall be expressly applicable to Rate Contracts. Any violation of the fall clause would be considered a serious misdemeanour under clause 44 of the GIT and action, as appropriate, would be taken as per provision of that clause.

50.3 Performance Security

Depending on the anticipated overall withdrawal/off-take against a rate contract and, also, anticipated number of parallel rate contracts to be issued for an item, the procuring entity shall consider obtaining Performance Security @ 5% (Five percent) of the value of supply order in the supply orders issued against rate contracts on the rate contract holder.

50.4 Renewal of Rate Contracts

In case it is not possible to conclude new rate contracts before the expiry of existing ones, due to some special reasons, the existing rate contracts would be extended with same terms, conditions etc. for a suitable period, with the consent of the rate contract holders. Rate contracts of the firms, who do not agree to such extension, will be left out. Period of such extension would generally not be more than three months.

51. Prequalification Bidding (PQB)

51.1 Prequalification Bidding is for short listing of qualified Bidders who fulfil the Prequalification criteria (PQC) as laid down in SIT or in Section IX of SBD - "Qualification Criteria" for procurement of Goods or Services as listed in Section VI of SBD - "List of Requirements". Short listed Bidders would be informed of their qualification and short listing in accordance with the stipulations laid down in the SIT. Unless otherwise stipulated in the SIT, the PQB short listing would be valid only till the next procurement tender. Further conditions will be elaborated in the SIT.

51.2 If stipulated in the SIT, only these short-listed qualified bidders would be invited to participate in the Procurement of the requirements. Otherwise SIT may also indicate that instead of floating a separate PQB tender, it may be combined with the Procurement Tender, as a three bid (envelope) tender. Initially the first envelope containing PQB would be opened and evaluation would be done. Thereafter the rest of tender would be handled as a two-bid system for only those bidders who succeed in PQB.

51.3 Unless otherwise stipulated in NIT/ SIT, EMD would be required as per clause 18 of GIT from unregistered bidders. No separate EMD would be called from short-listed bidders for the subsequent procurement bidding. In case a shortlisted bidder does not participate in subsequent procurement bidding, the EMD shall be forfeited.

52. Tenders involving Samples

52.1 Normally no sample would be called along with the offer for evaluation.

52.2 Purchaser's Samples: If indicated in the SIT, a Purchaser's sample may be displayed to indicate required characteristics over and above the Specifications for perusal of the bidders. Name and Designation of the Custodian, Place, Dates and Time of inspection of Purchaser's sample will be indicated in the SIT. The supplies in the contract will have to meet the indicated required characteristics for which the Purchaser's sample was displayed, besides meeting the specification listed in Section VII - "Technical Specifications" of the SBD. He would be issued a sealed Purchaser's sample for the purpose at the time of award of the contract.

52.3 Pre-Production Samples: If stipulated in SIT, successful contractor would be required to submit a Pre-Production sample(s) to the Inspecting Officer or the nominated authority mentioned in the contract within the time specified therein. If the Contractor is unable to do so, he must apply immediately to the Office issuing the acceptance of tender for extension of time stating the reasons for the delay. If the Purchaser is satisfied that a reasonable ground for an extension of time exists, he may allow such additional time as he considers to be justified (and his decision shall be final) with or without alteration in the delivery period stipulated in the contract and on such conditions as he deems fit. In the event of the failure of the Contractor to deliver the pre-production sample by the date specified in the acceptance of tender or any other date to which the time may be extended as aforesaid by the Purchaser or of the rejection of the sample, the Purchaser shall be entitled to cancel the contract and, if so desired, purchase or authorize the purchase of the stores at the risk and cost of the Contractor (unless specified otherwise in the SIT). In such an event, in case of Security Items where urgency develops due to such delays, BRBNMPL reserves its right to procure not more than one year's requirement against this "Risk & Cost" tender from existing pre-qualified and security cleared firms. Bulk production and supply will only be allowed if this sample(s) pass the Tests laid down in the Section VIII "Quality Control Requirements" in the SBD.

52.4 Testing of Samples: Tests, procedures and testing laboratories for testing samples would be detailed in the Section VIII - "Quality Control Requirements" in the SBD.

52.5 Validation / Prolonged Trials: If specified in SIT or in the Section VIII - "Quality Control Requirements" in the SBD, pre-production samples may have to undergo validation or extended trial before their performance can be declared satisfactory.

52.6 Parameters Settings and duration of Validation Tests would be indicated in the Section VIII - "Quality Control Requirements" in the SBD. It would also stipulate the period or event marking end of validation trials. It would also be indicated therein whether the Permission to start bulk production will have to wait full validation or it can go on in parallel.

53. Expression of Interest (EOI) Tenders:

53.1 EOI tenders are floated for short fisting firms who are willing and qualified for: -

(i) Registration of Vendors for Supply of particular Stores or certain categories of Stores.

(ii) Development of new items or Indigenization of Imported stores

53.2 The qualification / eligibility criteria required and the format of submission of such Data would be indicated in the Section IX - "Qualification Criteria" in the SBD.

53.3 Objectives and scope of requirement would be indicated in the Section VI -"List of Requirements" in the SBD. Indicative quantity required yearly and its future requirements would also be indicated.

53.4 In case of EOI for Development of new Items or for Indigenization, prospective firms would be given opportunity to inspect the Machine / Item at the place of installation at the place, dates and Time mentioned in SIT.

53.5 In case EOI is for registration of vendors, Registration Fees and validity period of registration would be detailed in the SIT.

53.6 Short List of Suppliers: The suppliers shall be evaluated for short listing, inter-alia, based on their past experience of supplying goods in similar context, financial strength, technical capabilities etc. Each supplier will be assigned scores based on weightages assigned to each of the criteria mentioned in the Section IX - "Qualification Criteria" in the SBD.

53.7 If stipulated in the SIT, the Firm's capacity and Capability may be assessed by a nominated Committee or by a third party nominated by BRBNMPL.

53.8 All suppliers who secure the minimum required marks (normally 50% unless otherwise specified in the Section IX) would be short listed. Section IX may alternatively specify minimum qualifying requirement for each of the criteria i.e. minimum years of experience, minimum number of assignments executed, minimum turnover etc. Under such circumstances, all suppliers who meet the minimum requirement, as specified, will be short listed_

53.9 In case of EOI for registration of vendors, registration letters would be issued to the short-listed tenderers.

53.10 In case of EOI for development / indigenization, these shortlisted tenderers would only be allowed to participate in the subsequent development/ indigenization tenders.

54. Tenders for Disposal of Scrap

54.1 **Introduction:** The tender is for Sale of Scrap material lying at various locations. Details of scrap for sale including Description, Present Condition, Lot Size and its Location would be given in the Section VI - "List of Requirements".

54.2 "As Is; Where Is; Whatever Is" Basis of This Sale:

54.2.1 This sale of Scrap is strictly on "As is; Where is; Whatever is" basis. Tenderer must satisfy himself on all matters with regard to quality, quantity, nature of stores etc., before tendering as no complaint or representation of any kind shall be entertained after the safe contract is concluded.

54.2.2 The description of lot in the particulars of sale has been given for the purpose of identification thereof only and the use of such description shall not constitute the sale thereof to be sale by description and no sale shall be invalid by reason of any defect or deviation or variation in any lot or on account of any lot not being exactly described and the purchaser shall not be entitled to claim any damage or compensation whatsoever on account of such fault, error in description, weight or the like.

54.2.3 All quantities of scrap whether by weight or measurement mentioned in the Tender notice are only approximate and should the quantity, on actual weight or measurement basis as the case may be and whenever delivered on such basis, works out less than the advertised and for projected quantity, the BRBNMPL shall not under any circumstances be liable to make good any such deficiency

54.2.4 BRBNMPL reserves right to increase or decrease the quantity of any item or items or terminate the contract at any stage by giving one week's notice. No claim whatsoever shall lie against the BRBNMPL on account of such termination of the contract or variation in the quantity.

54.2.5 BRBNMPL shall have the right to remove certain items which it feels were not intended for sale but were inadvertently made a part of the scrap material or of the lot offered for sale lying at the premises or were joined or attached to the material offered for sale.

54.2.6 Tenderers desirous of purchasing and participating in the tender must visit the site before submitting the offer, after taking due permission from the concerned Stock Holders. The Tenderers submitting the offers shall be deemed to have visited the site and acquainted themselves thoroughly with materials intended for sale in all respect.

54.2.7 Any person giving offer shall be deemed to have made himself fully conversant with the Terms and Conditions of the Tender Sale, as well as the location and condition of the materials being sold and shall be deemed to have agreed to all the stated terms and conditions herein under.

54.3 Submission of Offer

54.3.1 Unless specified otherwise in the SIT, tenders shall hold good for acceptance for a minimum period of 90 days (ninety days) from the date of opening of the tenders. The offers of the tenderers shall be irrevocable.

54.3.2 **Right to Reject all Bids:** The seller reserves the right to accept/reject and cancel any bid, amend the quantity under any lot or withdraw any lot at any stage after acceptance of bid/issue of acceptance letter/sale order/delivery order/deposit of the full sale value by the bidder, without assigning any reason thereof and the value of such material, if paid for, shall be refundable. The seller shall not be responsible for damage/loss to bidders on account of such withdrawal at any stage from the sale.

54.3.3 Unless otherwise stated in the SIT, the amount of EMD in such tenders would be 5% of the value of the tender. The Earnest Money shall be forfeited if the tenderer unilaterally withdraws amends, impairs or derogates from his offer in any respect within the period of validity of his offer.

54.3.4 If the offer of the tenderer is not accepted by the BRBNMPL, the Earnest Money deposit made by the tenderer shall be refunded to him. No interest shall be payable on such refunds. The EMD deposited by the successful tenderer shall remain with the BRBNMPL till payment of the security deposit (SD) money, as stipulated in relevant Clause, has been made. It may be adjusted as part of the total SD money at the discretion of the BRBNMPL.

54.3.5 Duties, taxes and other levies of local bodies, whatever in force, shall be payable extra by the purchaser as per rules applicable to BRBNMPL. Current and valid PAN and Goods and Services Tax Identification Number (GSTIN), wherever applicable, must be provided in the Bid of the Tenderer. Any statutory variations in the rate of taxes/duties are to be borne by the purchaser. GST rates indicated in the e-auction catalogue are only indicative and the actual GST rates as applicable on the date shall be payable by the successful bidders directly to the seller at the time of taking delivery of materials. Tax Collected at Source (TCS) at the prevailing rate may be deducted from all payments made to the buyer. In order to avoid the imposition of penalty, the amount deposited by the successful bidder towards taxes, duties and TCS will be immediately deposited with the concerned tax authorities without waiting for the actual delivery.

54.3.6 All arrangement for lifting and transportation of scrap material, including manpower, crane, transport vehicle and trolley etc., if required shall be made by the purchaser concerned only and the BRBNMPL shall not provide or help in providing any such arrangements and the rate quoted by the purchaser must include such and all incidental charges.

54.3.7 Registered dealers who are exempted from payment of Goods and Services Tax must give reference to Goods and Services Tax laws which provides such exemption or submit any certificate as issued by the Goods and Services tax authorities and shall be required to submit necessary form duly completed in all respect to BRBNMPL or its representatives before obtaining delivery order, duly signed by the partner of the firm or the person authorized to do so.

54.3.8 Evaluation of tenders for Disposal of scrap will be done on similar basis as Tenders for Procurement of Goods, except that the selection of the bidders shall be on the basis of the highest responsive Bidder (H1). In case full quantity is not offered to be taken by the Highest Bidder, parallel contracts would be placed.

54.3.9 **Sale of Items/Lots Comprising Hazardous Waste:** Sale of hazardous waste items will be governed by the following procedures in addition to guidelines/ notifications issued by the Central/State Pollution Control Board (PCB)/Ministry of Environment and Forests (MoEF) from time to time:

(i) Sale of old batteries/lead acid batteries will be governed by the Batteries (Management & Handling) Rules, 2001 and its subsequent amendments.

(ii) Sale of other categories of hazardous waste items will be governed by the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 and its subsequent amendments and/or their relevant statutory act/rules.

(iii) Sale of e-waste shall be governed by e-Waste (Management and Handling) Rules, 2011.

(iv) Bidders must submit a notarized copy of the valid registration certificates issued by the State (or Union Territory) Pollution Control Board (PCB) and produce it at the time of taking delivery of the materials, failing which their bid will be liable for rejection. In case of lead acid batteries, used/waste oils, and non-ferrous metal wastes, in addition to submitting necessary valid registration from the SPCB, the bidder must also submit a notarized copy of the valid registration certificate from CPCB (or MoEF); and

(v) In case of a sale involving inter-state movement of goods, the buyer shall also submit an NOC from the concerned SPCB, with whom the buyer is registered, to the seller before taking delivery,

failing which the buyer will be responsible for the consequences and the seller shall take further decision as may be deemed fit.

54.4 Notification of Acceptance and Award of Contract:

54.4.1 The successful tenderer, herein after referred to as purchasers, shall have to submit security deposit (SD) @ 10% of the total sale value of the contract within 5 working days of issue of the sale contract (excluding the date of issue of sale contract). The SD shall be deposited in the form of account payee demand draft drawn on any scheduled commercial bank in India in favour of Bharatiya Reserve Bank Note Mudran Private Limited or through online transfer or through other electronic mode of payment as mentioned at relevant clause of NIT in connection with EMD.

54.4.2 The purchaser has to pay balance payment within 20 days from the date of notification of acceptance, which is to be issued by BRBNMPL or his authorized representative, in the form of account payee demand draft drawn on any scheduled commercial bank in India in favour of Bharatiya Reserve Bank Note Mudran Private Limited or through online transfer or through other electronic mode of payment. In case of any default to deposit balance payment, BRBNMPL reserves right to terminate the contract and forfeit the security deposit.

54.5 Disposal Tenders for Security and Sensitive Machinery and Items:

54.5.1 Non-Misuse Declaration: The bidder is required to give an undertaking that he or his employees or legal heirs will ensure that such items purchased from BRBNMPL, will be utilized only for scrap recovery and will not be misused for any other purpose. He will also ensure that this undertaking is honoured and it got underwritten from further down the line scrap processors / re-purchasers, if any. In case his firm changes hands, it will be his responsibility to ensure that the new owners honour and underwrite this undertaking.

54.5.2 If stipulated in SIT delivery would be given only in dismantled / cut-up condition.

55. Development and Indigenization Tenders:

55.1 Already developed firms or firms who have already received development orders for the item (with whatever results) would not be considered in such tenders.

55.2 If specified in SIT the contract documents may be issued free of cost, and submission of earnest money deposit and security deposit may be relaxed.

55.3 If specified in SIT, The Tenderers may quote separately for

(i) Price / rate for bulk supply of item in development / indigenization supplies and

(ii) Separately, cost of development including cost of pre-production samples. Firms would be paid only for the number of samples specified in the Tender. If he has to manufacture more samples due to failure of earlier one, he would not be paid for it.

55.4 L1 would be determined on the basis of rate of item quoted including reference to total cost of the development cost (including the cost of prototype) plus the notional total cost of quantities that will be required over next three years, wherever applicable.

55.5 Development contracts may, as far as feasible, be concluded with two or more contractors in parallel.

55.6 The ratio of splitting of the supply order between various development agencies / firms in cases of parallel development, including criteria thereof, would be specified in the SIT.

55.7 However, in case the requirement is meagre and complex technology is involved, or quantity of the equipment / spares is limited/small/uneconomic if distributed between two vendors, the entire order could be placed upon the L1 vendor only.

55.8 If specified in SIT, Advance and Intermediate Payment to Suppliers may be allowed.

55.9 Quantity for Development Commitment

In Next three years, after the newly developed firm is able to successfully complete Development orders with ±5% tolerances, 20% of annual quantity requirement may be reserved for Newly Developed firms.

55.10 Period of Development Commitment

A newly developed firm would be granted this facility till only three years after completing the initial Development order. However, this facility is not a bar to the firm from competing with already established firms for quantities larger than 20% provided their prices and performance so warrant. Thereafter they would have to compete on equal terms with other already developed firms.

****

भाग / Section III:

निविदाकर्ताओं के लिए विशेष अनुदेश / Special Instructions to Tenderers (SIT)

The following Special Instructions to Tenderers will apply for this purchase. These special instructions will modify/ substitute/ supplement the corresponding General Instructions to Tenderers (GIT) incorporated in Section II. The corresponding GIT clause numbers have also been indicated in the text below:

In case of any conflict between the provision in the GIT and that in the SIT, the provision contained in the SIT shall prevail.

(Clauses of GIT listed below include a possibility for variation in their provisions through SIT. There could be other clauses in SIT as deemed fit).

Sl. No.	GIT Clause	Topic	SIT Provision
1	1, 2,	PREAMBLE-Introduction, Language of Tender	No Change
2	3	Eligible Tenderers	Applicable.
3	4	Eligible Goods & Services (Origin of Goods)	Applicable.
4	5, 6, 7	Tendering Expense, TENDER DOCUMENTS, Amendments to Tender Documents	No Change
5	8	Pre bid Conference	Not Applicable
6	9	Time Limit for receiving request for clarification of Tender Documents	In case of any clarification, please contact BRBNMPL/MSTC, (at least 07 days prior to the scheduled opening of the e-tender).
7	10, 11, 12	Documents Comprising the Tender, Tender Currencies, Tender Prices	No Change
8	12.8	GST	Applicable
9	14	Firm Price / Variable Price	The quoted rates (inclusive of all taxes) shall be **firm and fixed** and shall not be subject to any variation/escalation (except Statutory Payments against submission of documentary evidence) on any account during the contract period.
10	18	EMD	EMD of Rs. 4,90,000/- (Rupees Four Lakh Ninety Thousand only) is payable in the same way as mentioned at point No. 13 of NIT. Proof of EMD submission to be attached along with technical bid. However, exempted bidders have to submit **"Bid Securing Declaration"** in lieu of EMD as per Annexure 7 in Company Letterhead.
11	19	Tender Validity	120 days from date of opening of tender.
12	20	Number of Copies of Tenders to be submitted	The Bids are to be submitted online at www.mstcecommerce.com/eprocn

13	21, 22 23, 24, 25	Submission of Tenders, Late Tender, Alteration and Withdrawal of Tender, Opening of tenders, Basic Principle	No Change
14	31	Qualification and Eligibility Criteria	Relaxation of Norms with regard to Prior Turnover and Prior experience for **Class-I and Class-II local suppliers and Start-up's [MSEs or otherwise]** subject to meeting of quality and technical specifications as referred in Annexure 1 to 5. **Note:** This tender does not fall under the category of procurement of items/services related to public safety, health, critical security operations and equipment, etc. [Refer Annexure 1 to 5]. ***Note: This tender falls under category of Works Contract;* so, Relaxation of Norms wrt Prior Turnover & Prior Experience <u>shall not be applicable to MSE's</u> UNDER PUBLIC PROCUREMENT POLICY FOR MSE's ORDER 2012.**
15	35. 2	Additional Factors for Evaluation of Offers	Supplement with the following: Prospective bidders should meet our tender conditions and items being supplied should be strictly as per given specification without counter conditions. Tender shall be finalized on **the basis of Overall Lowest (L1) Bidder** from eligible bidders as per Section XI and as per other terms & conditions of the tender. Tender is non-splitable.
16	35.3	Additional Factors and Parameters for Evaluation and Ranking of Responsive Tenders	**A. This tender falls under category of Works Contract; so, Purchase Preference <u>shall not be applicable to MSE's</u> UNDER PUBLIC PROCUREMENT POLICY FOR MSE's ORDER 2012.** B. As per policies of the Government from time to time, the purchaser reserves its option to give price preference to Micro & Small Scale Industries in comparison to the large scale Industries. This price preference cannot however be taken for granted and every endeavour need to be made by such firms to bring down cost and achieve competitiveness. **In case of Identical Price Bids, Purchase preference as per Government Guidelines shall be exercised.**

17	43	Parallel Contracts	Not Applicable
18	45, 46, 47	Notification of Award, Issue of Contract, Non-receipt of Performance Security and Contract by BRBNMPL	No change a) On finalisation of Tender, Notification of Award of Contract (NOA) / Letter of Intent (LOI) will be issued by BRBNMPL to successful bidder. b) Successful Bidder shall furnish performance security to BRBNMPL within 21 days of issue of NOA/LOI as mentioned at Section V-SCC, Clause Sl. No. 03. c) Contract Agreement / Work Order will be placed only after acceptance of NOA/LOI and after submission of Performance Security by the Bidder. d) Non-Acceptance of Notification of Award of Contract (NOA) / Letter of Intent (LOI) and/or Non-Submission of Performance Security may lead cancellation of Notification of Award of Contract (NOA) / Letter of Intent (LOI). e) Time Schedule will be considered from the date issue of Notification of Award of Contract (NOA) / Letter of Intent (LOI).
19	50. 1, 50. 3	Tender For rate Contracts	Not applicable
20	51. 1, 51. 2	PQB Tenders	Not Applicable
21	52. 1, 52. 3, 52. 5	Tenders involving Purchaser's & Pre - Production Samples	Not applicable
22	53. 4, 53. 5, 53. 7	EOI Tenders	Not applicable
23	54. 3. 1, 54. 5. 2	Tenders for Disposal of Scrap	Not applicable
24	55. 2, 55. 3, 55. 7, 55. 8	Development/Indigenization Tenders	Not applicable

भाग / Section IV: संविदा की सामान्य शर्तें / General Conditions of Contract (GCC)

(For complete details refer our website www.brbnmpl.co.in under downloads)

Part I: General Conditions of Contract applicable to all types of Tenders

1. Interpretation; Definitions and Abbreviations: In the contract, unless the context otherwise requires:

1.1 Interpretation and Definitions:

(i) The heading of these conditions shall not affect the interpretation or construction thereof.

(ii) "Writing" or "Written" includes matter either in whole or in part, in manuscript, typewritten, lithographed, cyclostyled, photographed or printed under or over signature or seal, as the case may be.

(iii) Words in the singular include the plural and vice-versa.

(iv) Words importing the masculine gender shall be taken to include the feminine gender and words importing persons shall include any company or association or body of individuals, whether incorporated or not.

(v) Terms and expression not herein defined shall have the meanings assigned to them in the Indian Sale of Goods Act, 1930 (as amended) or the Indian Contract Act, 1872 (as amended) or the General Clauses Act, 1897 (as amended) as the case may be.

(vi) Any reference to 'Goods' shall be deemed to include the incidental Works/Services also while any reference to 'Services' shall be deemed to include the incidental Works/Goods also.

(vii) Any generic reference to GCC shall also imply a reference to SCC as well.

(viii) In case of conflict, provisions of SCC shall prevail over those in GCC.

(ix) Any reference to 'Contract' shall be deemed to include all other documents (inter-alia GCC, SCC) as described in GCC-clause 2.5.

(x) Any reference to any legal Act, Government Policies or orders shall be deemed to include all amendments to such instruments, from time to time, till date.

(xi) "Allied Firms" are all business entities that are within the 'controlling ownership interest' (ownership of or entitlement to more than twenty-five percent of the company's shares or capital or profits) or 'control'(including the right to appoint a majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholder agreements or voting agreements) of the principal firm acting alone or together or through one or more juridical persons. All successor firms or assigns of the principal firm shall be considered allied firms.

(xii) "Bid" (including the term 'tender', 'offer', 'quotation' or 'proposal' in specific contexts) means an offer to supply goods, services or execution of works made as per the terms and conditions set out in a document inviting such offers.

(xiii) "Bidder" (including the term 'Bidder', 'consultant' or 'service provider' in specific contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a Tender Process.

(xiv) "Bill of Quantities" (including the term Price Schedule or BOQ) means the priced and completed Bill of Quantities forming part of the bid.

(xv) "Consignee" means the person to whom the goods are required to be delivered as specified in the Contract. If the goods are required to be delivered to a person as an interim consignee for the purpose of dispatch to another person as provided in the Contract then that "another" person is the consignee, also known as ultimate consignee.

(xvi) "Contract" (including the terms 'Purchase Order' or 'Supply Order' or 'Withdrawal Order' or 'Work Order' or 'Consultancy Contract' or 'Contract for Services', 'Rate Contract' or 'Framework Contract' or 'Letter of Intent – LoI' (letter or memorandum communicating to the contractor the acceptance of his bid) or 'Agreement' or a 'Repeat Order' accepted/acted upon by the contractor or a 'formal Agreement', under specific contexts), means a formal legal agreement in writing relating to the subject matter of procurement, entered into between the Procuring Entity and the contractor on mutually acceptable terms and conditions and which are in compliance with all the relevant provisions of the laws of the country;

(xvii) "Contractor" (including the terms 'Supplier' or 'Service Provider' or 'Consultant' or 'Firm' or 'Vendor' or 'Manufacturer' or 'Successful Bidder' under specific contexts) means the person, firm, company, or a Joint Venture with whom the contract is entered into and shall be deemed to include the contractor's successors (approved by the Procuring Entity), agents, subcontractor, representatives, heirs, executors, and administrators as the case may be unless excluded by the terms of the contract.;

(xviii) "Day", "Month", "Year" shall mean calendar day/ month or year (unless reference to financial year is clear from the context).

(xix) "Drawing" means the drawing or drawings specified in or annexed to the Specifications or the Tender Document/Contract;

(xx) "Earnest Money Deposit" (EMD) means monetary guarantee to be furnished by a Tenderer along with its tender.

(xxi) "Goods" (including the terms 'Stores', 'Material(s)' in specific contexts) includes all articles, material, commodity, livestock, medicines, furniture, fixtures, raw material, consumables, spare parts, instruments, machinery, equipment, industrial plant, vehicles, aircrafts, ships, railway rolling stock assemblies, subassemblies, accessories, a group of machines comprising an integrated production process or such other categories of goods or intangible products like technology transfer, licenses, patents or other intellectual properties (but excludes books, publications, periodicals, etc., for a library) under specific context), procured or otherwise acquired by a Procuring Entity. Any reference to Goods shall be deemed to include certain small work or some services, which are incidental or consequential to the supply of such goods, such as transportation, insurance, installation, commissioning, training and maintenance.

(xxii) "Government" means the Central Government or a State Government as the case may be and includes agencies and Public Sector Enterprises under it, in specific contexts;

(xxiii) "Inspection" means activities such as measuring, examining, testing, analysing, gauging one or more characteristics of the goods or services or works, and comparing the same with the specified requirement to determine conformity.

(xxiv) "Inspecting Officer" means the person, or organisation specified in the contract for the purpose of inspection under the contract and includes his / their authorised representative;

(xxv) "Intellectual Property Rights" (IPR) means the rights of the intellectual property owner concerning a tangible or intangible possession/ exploitation of such property by others. It includes rights to Patents, Copyrights, Trademarks, Industrial Designs, Geographical indications (GI).

(xxvi) "Joint Venture" means a Joint Venture or a Consortium (that is an association of several persons, or firms or companies - also referred to as JV/C)

(xxvii) "Purchaser" means BRBNMPL - the organization purchasing goods and services as incorporated in the documents;

(xxviii) "Purchase Officer" means the officer signing the acceptance of tender and includes any officer who has authority to execute the relevant contract on behalf of the Purchaser;

(xxix) "Parties": The parties to the contract are the "Contractor" and the "Purchaser", as defined above;

(xxx) "Performance Security" (includes the terms 'Security Deposit' or 'Performance Bond' or 'Performance Bank Guarantee' or other specified financial instruments in specific contexts) means monetary guarantee to be furnished by the successful Tenderer for due performance of the contract placed on it.

(xxxi) "Place of Delivery": The delivery of the stores shall be

deemed to take place on delivery of the stores in accordance with the terms of the contract, after approval by the Inspecting Officer, if so provided in the contract:

a) The consignee at his premises; or
b) Where so provided, the interim consignee at his premises; or
c) A carrier or other person named in the contract for the purpose of transmission to the consignee; or
d) The consignee at the destination station in case of contract stipulating for delivery of stores at destination station.

(xxxii) "Procurement" or "public procurement" (or 'Purchase', or 'Government Procurement/Purchase' including an award of Public-Private Partnership projects, in specific contexts) means the acquisition of Goods/Services/works by way of purchase, lease, license or otherwise, either using public funds or any other source of funds (e.g. grant, loans, gifts, private investment etc.) of goods, works or services or any combination thereof, by a Procuring Entity, whether directly or through an agency with which a contract for procurement services is entered into, but does not include any acquisition without consideration. The term "procure" / "procured" or "purchase" / "purchased" shall be construed accordingly;

(xxxiii) "Scheduled Commercial Bank" means a bank, defined as a scheduled bank under section 2(e) of the Reserve Bank of India Act, 1934.

(xxxiv) "Services" is defined by exception as any subject matter of procurement other than goods or works, except those incidental or consequential to the service, and includes physical, maintenance, professional, intellectual, training, consultancy and advisory services or any other service classified or declared as such by a Procuring Entity but does not include appointment of an individual made under any law, rules, regulations or order issued in this behalf. It includes 'Consultancy Services' and 'Other (Non-consultancy) Services'.

(xxxv) "Specification" or "Technical Specification" means the drawing/ document/standard or any other details governing the construction, manufacture or supply of goods or performance of services that prescribes the requirement to which goods or services have to conform as per the contract.

(xxxvi) "Signed" means ink signed or digitally signed with a valid Digital Signature as per IT Act 2000 (as amended from time to time). It also includes stamped, except in the case of Letter of Award or amendment thereof.

(xxxvii) "Tender"; "Tender Document"; "Tender Enquiry" or "Tender Process": 'Tender Process' is the whole process from the publishing of the Tender Document till the resultant award of the contract. 'Tender Document' means the document (including all its sections, appendices, forms, formats, etc.) published by the Procuring Entity to invite bids in a Tender Process. The Tender Document and Tender Process may be generically referred to as "Tender" or "Tender Enquiry", which would be clear from context without ambiguity.

(xxxviii) "Test" means such test as is prescribed by the particulars governing the construction, manufacture or supply of Goods as may be prescribed by the contract or considered necessary by the Inspecting Officer whether performed or made by the Inspecting Officer or any agency acting under the direction of the Inspecting Officer;

(xxxix) "Works" refer to any activity, sufficient in itself to fulfil an economic or technical function, involving construction, fabrication, repair, overhaul, renovation, decoration, installation, erection, excavation, dredging, and so on, which make use of a combination of one or more of engineering design, architectural design, material and technology, labour, machinery and equipment. Supply of some materials or certain services may be incidental or consequential to and part of such works. The term "Works" includes (i) civil works for the purposes of roads, railway, bridges, buildings, irrigation systems, water supply, sewerage facilities, dams, tunnels and earthworks; and so on, and (ii) mechanical and electrical works involving fabrication, installation, erection, repair and maintenance of a mechanical or electrical nature relating to machinery and plants.

1.2 Abbreviations:

"AAEC"	means "Appreciable Adverse Effect on Competition" per Competition Act
"BG"	means Bank Guarantee
"BL or B/L"	means Bill of Lading
"BOQ"	means Bill of Quantities
"BSD"	means Bid Securing Declaration
"BNPMIPL"	means Bank Note Paper Mill India Private Limited
"BRBNMPL"	means Bhartiya Reserve Bank Note Mudran Private Limited
"CD"	means Custom Duty
"CFR"	means Cost and Freight (port of destination)
"CIF"	means Cost, Insurance and Freight (port of destination)
"CMD"	means Chairman and Managing Director
"CPSU"	means Central Public Sector Undertaking
"DAP"	means Delivered at Place (Destination)
"DDO"	means Direct Demanding Officer in Rate Contracts
"DEA"	means Department of Economic Affairs
"DoCC"	means Currency and Coins Division in Department o Economic Affairs
"DGS&D"	means Directorate General of Supplies and Disposal
"DP"	means Delivery Period
"DPIIT"	means Department for Promotion of Industry and Internal Trade
"DSC"	means Digital Signature Certificate
"ECS"	means Electronic clearing system
"EFT/NEFT"	means (National) Electronic Funds Transfer
"EMD"	means Earnest money deposit
"EOI"	means Expression of Interest (Tendering System)
"e-RA"	means Electronic Reverse Auction
"ERV"	means Exchange rate variations
"FAS"	means Free Alongside Ship (port of loading)
"FOB"	means Freight on Board (port of loading)
"FOR"	means Free on Rail (named Station)
"GCC"	means General Conditions of Contract
"GeM"	means Government e-Marketplace
"GIT"	means General Instructions to Tenderers
"GoI"	means Government of India
"GST"	means Goods and Services Tax
"H1, H2 etc."	means First Highest, Second Highest Offers etc. in Disposal Tenders
"HSN"	means Harmonized System of Nomenclature
"IEM"	means Independent External Monitor
Incoterms	means International Commercial Terms, 2000 (of IC
"INR"	means Indian Rupee
"IPR"	means Intellectual Property Rights
"ITC (HS)"	means Indian Tariff Classification (Harmonised System)
"L1, L2 etc."	means First or second Lowest Offer etc.
"LC"	means Letter of Credit
"LD or L/D"	means Liquidated Damages
"LoI"	means Letter of Intent [analogous to LoA – Letter of Award (Acceptance) or Notification of Award of Contract]
"LSI"	means Large Scale Industry
"MII"	means Make in India
"MoF"	means Ministry of Finance
"MSE"	means Micro and Small Scale Enterprise
"MSME"	means Micro, Small and Medium Enterprises
"MSMED"	means MSME Development (Act)
"NIT"	means Notice Inviting Tenders
"NSIC"	means National small industries corporation
"OEM"	means Original Equipment Manufacturer
"PAN"	means Permanent Account Number
"PQB"	means Pre-qualification bidding
"PSU"	means Public Sector Undertaking

"PVC"	means Price variation clause
"RBI"	means Reserve Bank of India
"RC"	means Rate contract
"RCM"	means Reverse Charge Mechanism
"RFI"	means Request for Information
"RFP"	means Request for Proposal
"RFQ"	means Request for Qualification
"RR or R/R"	means Railway Receipt
"SBD" or "TD"	means Standard Bid Document / Tender Document
"SCC"	means Special Conditions of Contract
"SIT"	means Special Instructions to Tenderers
"SPMCIL"	means Security Printing and Minting Corporation Limited
"SSI"	means Small Scale Industry

2. A. Application

2.1 The General Conditions of Contract incorporated in this section shall be applicable for this purchase to the extent the same are not superseded by the Special Conditions of Contract (SCC) prescribed under Section V of this document.

2.2 General Conditions of the contract shall not be changed from one tender to other.

B. The Contract

2.3 Language of Contract

Unless otherwise stipulated in SCC, the contract shall be written in the Official Language or English. All correspondence and other contract documents, which the parties exchange, shall also be written/translated accordingly in that language. For purposes of interpretation of the contract, the English documents/translation shall prevail.

2.4 Severability

If any provision or condition of this Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of this Contract.

2.5 Contract Documents and their Precedence

The following conditions and documents in indicated order of precedence (higher to lower) shall be considered an integral part of the contract, irrespective of whether these are not appended/referred to in it. Any generic reference to 'Contract' shall imply reference to all these documents as well:

(i) Valid and authorized Amendments issued to the contract.
(ii) the Agreement consisting of the initial paragraphs, recitals and other clauses set forth immediately before the GCC and including the formats annexed to it and signatures of Procuring Entity;
(iii) the Letter of Intent (LoI)
(iv) Final written submissions made by the contractor during negotiations, if any;
(v) the SCC
(vi) the GCC
(vii) the contractor's bid;
(viii) any other document listed in the SCC as forming part of this Contract.
(ix) Integrity Pact, if any

C. Governing Laws and Jurisdiction

2.6 The Contract, its meaning and interpretation, and the relation between the Parties shall be governed by the Laws of India for the time being in force.

2.7 Irrespective of the place of delivery, or the place of performance or the place of payments under the contract, the contract shall be deemed to have been made at the place from which the Letter of Intent (LoI, or the contract Agreement, in the absence of LoI) has been issued. The courts at Kolkata or Bengaluru shall alone have jurisdiction to decide any dispute arising out or in respect of the contract.

2.8 Besides GCC and SCC, the following Laws shall be applicable:

(i) Indian Contracts Act, 1872
(ii) Sale of Goods Act, 1930
(iii) Arbitration and Conciliation Act, 1996 and Arbitration and Reconciliation Amendment Act, 2015
(iv) Competition Act, 2002 as amended by Competition (Amendment Act), 2007

D. Contractor's Obligations and restrictions on its Rights

2.9 Changes in Constitution / financial stakes / responsibilities of a Contract's Business: The Contractor must proactively keep the Procuring Entity informed of any changes in its constitution / financial stakes / responsibilities during the execution of the contract.

2.10 Obligation to Maintain Eligibility and Qualifications: The contract has been awarded to the contractor based on specific eligibility and qualification criteria. The Contractor is contractually bound to maintain such eligibility and qualifications during the execution of the contract. Any change which would vitiate the basis on which the contract was awarded to the contractor should be pro-actively brought to the notice of the Procuring Entity within seven (07) days of it coming to the Contractor's knowledge. These changes include but are not restricted to change regarding declarations made by it in its bid in Section XVIII: Eligibility Declarations.

2.11 Consequences of a breach of Obligations: Should the Contractor or any of its Partners or its Subcontractors or the Personnel commit a default or breach of its obligations, the Contractor shall remedy such breaches within 21 days, keeping the Procuring Entity informed. However, at its discretion, the Procuring Entity shall be entitled, and it shall be lawful on his part, to treat it as a breach of contract and avail any or all remedies thereunder. The decision of the Procuring Entity as to any matter or thing concerning or arising out of GCC clause or on any question whether the contractor or any partner of the contractor firm has committed a default or breach of any of the conditions shall be final and binding on the contractor.

E. Permits, Approvals and Licenses

2.12 Whenever the supply of Goods and incidental Works/Services requires that the contractor obtain permits, approvals, and licenses from local public authorities, it shall be the contractor's sole responsibility to obtain these and keep these current and valid. Such requirements may include but not be restricted to export licence or environmental clearance, if required. If requested by the contractor, the Procuring Entity shall make its best effort to assist the contractor in complying with such requirements in a timely and expeditious manner, without any dilution of the Contractor's responsibility in this regard.

3. Use of contract documents and information

3.1 The supplier shall not, without BRBNMPL's prior written consent, disclose the contract or any provision thereof including any specification, drawing, sample or any information furnished by or on behalf of BRBNMPL in connection therewith, to any person other than the person(s) employed by the supplier in the performance of the contract emanating from this tender document. Further, any such disclosure to any such employed person shall be made in confidence and only so far as necessary for the purposes of such performance for this contract.

3.2 During the process of procurement of Security or Sensitive Machinery and Items, Tender Documents and the specifications / drawings of such items would be issued only to Vendors having security clearance within the validity of such clearance and he shall maintain absolute secrecy and strictly control the number of copies and access to the documents and copies thereof, in addition to safeguards mentioned in sub-para above.

3.3 Further, the supplier shall not, without BRBNMPL's prior written consent, make use of any document or information mentioned in GCC sub-clause 3.1 above except for the sole purpose of performing this contract.

3.4 Except the contract issued to the supplier, each and every other document mentioned in GCC sub-clause 3.1 above shall remain the property of BRBNMPL and, if advised by BRBNMPL, all copies of all such documents shall be returned to BRBNMPL on completion of the supplier's performance and obligations under this contract.

3.5 All deliverables, outputs, plans, drawings, specifications, designs, reports, and other documents and software submitted by the contractor under this Contract shall

become and remain the property of BRBNMPL and subject to laws of copyright and must not be shared with third parties or reproduced, whether in whole or part, without BRBNMPL's prior written consent. The contractor may retain a copy of such documents and software but shall not use it for any commercial purpose.

4. Indemnities for breach of IPR Rights

4.1 The contractor shall indemnify and hold harmless, free of costs, the Procuring Entity and its employees and officers from and against all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of any nature, including attorney's fees and expenses, which may arise in respect of the Goods or Services provided by the contractor under this Contract, as a result of any infringement or alleged infringement of any patent, utility model, registered design, copyright, or other Intellectual Proprietary Rights (IPR) or trademarks, registered or otherwise existing on the date of the contract arising out of or in connection with:

(i) Any design, data, drawing, specification, or other documents or Goods or Services provided or designed by the contractor for or on behalf of the Procuring Entity.

(ii) The sale by the Procuring Entity in any country of the Services/ products produced by the Goods supplied by the contractor, and

(iii) The installation of the Goods by the contractor/Delivery of the services or the use of the Goods or Services at the Procuring Entity's Site.

4.2 Such indemnity shall not cover any use of the Goods or Services or any part thereof or any products produced thereby:

(i) other than for the purpose indicated by or to be reasonably inferred from the contract

(ii) neither any infringement resulting from the use of the Services or any part thereof,

(iii) or any service/products produced thereby in association or combination with any other service, equipment, plant, or materials not supplied by the contractor.

4.3 If any proceedings are brought, or any claim is made against the Procuring Entity arising out of the matters referred above, the Procuring Entity shall promptly give the contractor a notice thereof. At its own expense and in the Procuring Entity's name, the contractor may conduct such proceedings and negotiations to settle any such proceedings or claim, keeping the Procuring Entity informed.

4.4 If the contractor fails to notify the Procuring Entity within twenty-eight (28) days after receiving such notice that it intends to conduct any such proceedings or claim, then the Procuring Entity shall be free to conduct the same on its behalf at the risk and cost to the contractor.

4.5 At the contractor's request, the Procuring Entity shall afford all available assistance to the contractor in conducting such proceedings or claim and shall be reimbursed by the contractor for all reasonable expenses incurred in so doing.

5. Eligible Goods/Services - Country of Origin and Minimum Local Content

5.1 Unless otherwise stipulated in SCC or Contract, the country of origin of 'Goods' and 'incidental Works/ Service' to be supplied under the contract shall have their origin in India or other countries and must conform to the declaration made by the contractor in its bid regarding but not limited to i) restrictions on certain countries with land-borders with India; ii) minimum local content and location of value addition (Make in India Policy); iii) Contractor's status as MSE or Start-up.

5.2 The term "origin" used in this clause means where the goods (including subcontracted components) are mined, grown, produced, or manufactured or from where the incidental Works/ Services are arranged and supplied.

6. Performance Security

6.1 Within twenty-one (21) days (or any other period mentioned in Tender Document or Contract) after the issue of notification of award (LoI or the contract, if LoI is skipped) by BRBNMPL, the supplier shall furnish to BRBNMPL performance security for an amount of **three to ten percent (3-10%)** of the total value of the contract, valid up to sixty (60) days (or any other period mentioned in Tender Document or Contract) after the date of completion of all contractual obligations by the supplier, including the warranty obligations.

6.2 For **multi-year Service contracts** which may be of 5-7 years or more, procuring entities may consider to proportionately keep reducing performance security in proportion to the balance service period, wherever feasible. Wherever it is decided to take lower or proportionately reducing performance security, tender conditions may be suitably modified.

6.3 The Performance security shall be denominated in Indian Rupees or in the currency of the contract and shall be in one of the following forms:

a) Insurance Surety Bond

b) Account Payee Demand Draft drawn on any scheduled commercial bank in India, in favour of Bharatiya Reserve Bank Note Mudran Private Limited as indicated in the relevant clause of NIT in reference to EMD.

c) Bank Guarantee (including e-Bank Guarantee) issued/ confirmed by any scheduled commercial bank in India, in the prescribed form as provided in section XV of this document.

6.4 In the event of any loss due to supplier's failure to fulfil its obligations in terms of the contract, the amount of the performance security shall be payable to BRBNMPL to compensate BRBNMPL for the same.

6.5 In the event of any amendment issued to the contract, the supplier shall, within twenty-one days of issue of the amendment, furnish the corresponding amendment to the Performance Security (as necessary), rendering the same valid in all respects in terms of the contract, as amended.

6.6 If the contractor during the currency of the Contract fails to maintain the requisite Performance Security, it shall be lawful for the Procuring Entity at its discretion:

(i) to terminate the Contract for Default besides availing any or all contractual remedies provided for breaches/default, or

(ii) without terminating the Contract:

a) recover from the contractor the amount of such security deposit by deducting the amount from the pending bills of the contractor under the contract or any other contract with the Procuring Entity, or

b) treat it as a breach of contract and avail any or all availing any or all contractual remedies provided for breaches/default.

6.7 Subject to GCC sub-clause 6.3 above, BRBNMPL will release the performance security without any interest to the supplier on completion of the supplier's all contractual obligations including the warranty obligations.

6.8 Non-receipt of Performance Security and Contract by BRBNMPL

Failure of the successful tenderer in providing performance security within 21 days of receipt of notification of award and / or returning contract copy duly signed within stipulated time shall make the tenderer liable for annulment of the award and forfeiture of its EMD (or enforcement of Bid Securing Declaration), besides taking other administrative punitive actions by BRBNMPL against it.

6.9 No Claim Certificate and Release of Contract Securities

After mutual reconciliations of outstanding payments and assets on either side, the contractor shall submit a 'No-claim certificate' to the Procuring Entity requesting the release of its contractual securities, if any. The Procuring Entity shall release the contractual securities without any interest if no outstanding obligation, asset, or payments are due from the contractor. The contractor shall not be entitled to make any claim whatsoever against the Procuring Entity under or arising out of this Contract, nor shall the Procuring Entity entertain or consider any such claim, if made by the contractor, after he shall have signed a "No Claim" Certificate in favour of the Procuring Entity.

7. Technical Specifications and Standards

7.1 Scope of Supply/Services: The Goods & Services to be provided by the supplier under this contract shall conform to the technical specifications and quality control parameters mentioned in 'Technical Specification' and 'Quality Control Requirements' under Sections VII and VIII of this document.

7.2 **Incidental Works/Services:** If so stipulated, the contractor shall be required to perform specified incidental Works/Services (e.g., Installation, Commissioning, Operator's Training etc. in case of Supply of Capital Goods/Machinery & Plant) as an integral part of the Goods in the contract or perform/deliver specified incidental Works/Goods as an integral part of the Services in the contract.

8. Packing and Marking

8.1 The packing for the goods to be provided by the supplier should be strong and durable enough to withstand, without limitation, the entire journey during transit including transhipment (if any), rough handling, open storage etc. without any damage, deterioration etc. As and if necessary, the size, weights and volumes of the packing cases shall also take into consideration, the remoteness of the final destination of the goods and availability or otherwise of transport and handling facilities at all points during transit up to final destination as per the contract.

8.2 The quality of packing, the manner of marking within & outside the packages and provision of accompanying documentation shall strictly comply with the requirements as provided in Technical Specifications and Quality Control Requirements under Sections VII and VIII and in SCC under Section V. in case the packing requirements are amended due to issue of any amendment to the contract, the same shall also be taken care of by the supplier accordingly.

8.3 **Packing instructions:**

Unless otherwise mentioned in the Technical Specification and Quality Control Requirements under Sections VII and VIII and in SCC under Section V, the supplier shall make separate packages for each consignee (in case there is more than one consignee mentioned in the contract) and mark each package on three sides with the following with indelible paint of proper quality:

a) contract number and date
b) brief description of goods including quantity
c) the gross weight of the package
d) packing list reference number
e) country of origin of goods
f) consignee's name and full address and
g) supplier's name and address

9. Inspection and Quality Control

9.1 BRBNMPL and / or its nominated representative(s) will, without any extra cost to BRBNMPL, inspect and/or test the ordered goods and the related services to confirm their conformity to the contract specifications and other quality control details incorporated in the contract. BRBNMPL shall inform the supplier in advance, in writing, BRBNMPL's programme for such inspection and, also the identity of the officials to be deputed for this purpose.

9.2 The Technical Specification and Quality Control Requirements incorporated in the contract shall specify what inspections and tests are to be carried out and, also, where and how they are to be conducted. If such inspections and tests are conducted in the premises of the supplier or its subcontractor(s), all reasonable facilities and assistance, including access to relevant drawings, design details and production data, shall be furnished by the supplier to BRBNMPL's inspector at no charge to BRBNMPL.

9.3 If during such inspections and tests the contracted goods fail to conform to the required specifications and standards, BRBNMPL's inspector may reject them and the supplier shall either replace the rejected goods or make all alterations necessary to meet the specifications and standards, as required, free of cost to BRBNMPL and resubmit the same to BRBNMPL's inspector for conducting the inspections and tests again.

9.4 In case the contract stipulates pre-despatch inspection of the ordered goods at suppliers' premises, the supplier shall put up the goods for such inspection to BRBNMPL's inspector well ahead of the contractual delivery period, so that BRBNMPL's inspector is able to complete the inspection within the contractual delivery period.

9.5 If the supplier tenders the goods to BRBNMPL's inspector for inspection at the last moment without providing reasonable time to the inspector for completing the inspection within the contractual delivery period, the inspector may carry out the inspection and complete the formality beyond the contractual delivery period at the risk and expense of the supplier. The fact that the goods have been inspected after the contractual delivery period will not have the effect of keeping the contract alive and this will be without any prejudice to the legal rights and remedies available to BRBNMPL under the terms & conditions of the contract.

9.6 BRBNMPL's contractual right to inspect, test and, if necessary, reject the goods after the goods' arrival at the final destination shall have no bearing of the fact that the goods have previously been inspected and cleared by BRBNMPL's inspector during pre-despatch inspection mentioned above.

9.7 Goods accepted by BRBNMPL and/or its inspector at initial inspection and in final inspection in terms of the contract shall in no way dilute BRBNMPL's right to reject the same later, if found deficient concerning 'Technical Specifications and Quality Assurance'.

10. Terms of Delivery

10.1 Goods shall be delivered by the supplier in accordance with the terms of delivery specified in the contract.

10.2 **Time is the Essence of the contract:** The time for and the date for delivering the Goods stipulated in the contract or as extended shall be deemed to be of the essence of the contract. Delivery must be completed not later than the date(s) so specified or extended.

10.3 Terms of delivery (e.g., F.O.R. destination/CIF/DAP etc.) shall determine the point at which the responsibilities and property in goods passes over from the contractor to the Procuring Entity. These terms also determine the time of delivery.

10.4 **Transfer of Title of Goods:** Unless otherwise stated in the contract, notwithstanding any inspection and approval by the Inspecting Officer on the contractor's premises, or any payments made to the contractor, property in the Goods (and resultant rights and liabilities) shall not pass on to the Procuring Entity until the Goods have been received, inspected, and accepted by the consignee. The Contractor shall be responsible for all loss, destruction, damage, or deterioration of or to the Goods from any cause whatsoever while the Goods after approval by the Inspecting Officer are awaiting despatch or delivery or are in the course of transit from the contractor to the consignee or, as the case may be, interim consignee. The Contractor shall alone be entitled and responsible for making claims against any carrier in respect of non-delivery, short delivery, mis-delivery, loss, destruction, damage, or deterioration of the Goods entrusted to such carrier by the contractor for transmission to the consignee or the interim consignee as the case may be.

10.5 **Quantity Tolerance:** Unless otherwise stipulated in the contract, the obligation for completing supplies shall be considered complete if the Goods have been supplied to the tolerance of ± 5% of the quantity or of the total value of goods ordered in the contract. Only the supplied quantity shall be paid for as per the terms of the contract.

11. Transportation of Goods

11.1 **Part Supplies:** The supplier shall not arrange part-shipments and / or transhipments without the express / prior written consent of BRBNMPL.

11.2 **Instructions for transportation of domestic goods including goods already imported by the supplier under its own arrangement:** In case no instruction is provided in this regard in the SCC, the supplier will arrange transportation of the ordered goods as per its own procedure.

11.3 **Shipping Arrangement for Foreign Contracts:** In the case of FOB/FAS contracts, shipping arrangements shall be made by BRBNMPL. The Contractor shall give adequate notice to the Forwarding Agents/Nominees about the readiness of the cargo from time to time and at least six weeks' notice in advance of the required position for finalising the shipping arrangements. In the case of CFR contracts, the Contractor shall arrange shipment in accordance with the instructions from BRBNMPL.

11.4 **Airlifting:** Should the Purchaser intend to airlift all or some of the stores the Contractor shall pack the stores accordingly on receipt of intimation to that effect from the Purchaser. Such deliveries will be agreed upon well in advance and paid for as may be mutually agreed.

12. Insurance:

Unless otherwise instructed in the SCC, the supplier shall make arrangements for insuring the goods against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the following manner:

(i) In case of supply of domestic goods on CIF/FOR destination basis, the supplier shall be responsible till the entire stores contracted for arrive in good condition at destination. The transit risk in this respect shall be covered by the Supplier by getting the stores duly insured. The insurance cover shall be obtained by the Supplier in its own name and not in the name of BRBNMPL or its Consignee.

(ii) In the case of FOB and CFR offers for import of Goods, insurance shall be arranged by the Purchaser. However, the supplier must give sufficient notice to the Purchaser prior to the date of shipment, so that the Insurance Cover for the shipment can be activated. The Supplier must co-ordinate so as to ensure that the Shipment sails only with Insurance cover in place.

(iii) In case of Import of Goods, even in case where the insurance is paid by the Purchaser, and loss or damage shall be made good by the Contractor free of cost, without waiting for the settlement of insurance claim. The payment after settlement of insurance claim shall be reimbursed by the Purchaser to the Contractor. It will be entirely the responsibility of the Contractor to make good loss/damage without waiting for settlement of insurance claim so that machine is commissioned within the time specified in the contract.

13. Spare parts

13.1 If specified in the List of Requirements and in the resultant contract, the supplier shall supply / provide any or all of the following materials, information etc. pertaining to spare parts manufactured and / or supplied by the supplier:

a) The spare parts as selected by BRBNMPL to be purchased from the supplier, subject to the condition that such purchase of the spare parts shall not relieve the supplier of any contractual obligation including warranty obligations; and

b) In case the production of the spare parts is discontinued:

i. sufficient advance notice to BRBNMPL before such discontinuation to provide adequate time to BRBNMPL to purchase the required spare parts etc., and

ii. immediately following such discontinuation, providing BRBNMPL, free of cost, the designs, drawings, layouts and specifications of the spare parts, as and if requested by BRBNMPL.

13.2 Supplier shall carry sufficient inventories to assure ex-stock supply of consumable spares for the goods so that the same are supplied to BRBNMPL promptly on receipt of order from BRBNMPL.

14. Incidental services

14.1 Subject to the stipulation, if any, in the SCC (Section V) and the Technical Specification (Section VII), the supplier shall be required to perform any or all of the following services:

a) Providing required jigs and tools for assembly, start-up and maintenance of the goods

b) Supplying required number of operation & maintenance manual for the goods

c) Installation and commissioning of the goods

d) Training of BRBNMPL's operators for operating and maintaining the goods

e) Providing after sales service during the tenure of the contract

f) Providing maintenance service after expiry of the warranty period of the goods if so incorporated in the contract

14.2 Prices to be paid to the supplier by BRBNMPL for any of the required incidental services, if not already included in the contract price during the placement of the contract, shall be settled and decided in advance by BRBNMPL and the supplier. However, such prices shall not exceed the contemporary rates charged by the supplier to other customers for similar services.

15. Distribution of Despatch Documents for Clearance / Receipt of Goods

15.1 The supplier shall send all the relevant despatch documents well in time to BRBNMPL to enable BRBNMPL to clear or receive (as the case may be) the goods in terms of the contract. Unless otherwise specified in the SCC, the usual documents involved and the drill to be followed in general for this purpose are as follows:

15.2 For Domestic Goods, including goods already imported by the supplier under its own arrangement, within 24 hours of despatch, the supplier shall notify BRBNMPL, consignee, and others concerned if mentioned in the contract, the complete details of despatch and also supply the following documents to them by registered post / speed post (or as instructed in the contract):

(a) Supplier's Invoice indicating, inter alia description and specification of the goods, quantity, unit price, total value;

(b) Packing list;

(c) Insurance certificate;

(d) Railway receipt / Road Consignment note;

(e) Manufacturer's guarantee certificate and in-house inspection certificate;

(f) Inspection certificate issued by BRBNMPL's inspector

(g) Expected date of arrival of goods at destination and

(h) Any other document(s), as and if specifically mentioned in the contract.

15.3 For Imported Goods, within 3 days of dispatch, the supplier will Notify BRBNMPL, consignee and other concerned if mentioned in the contract, the complete details of dispatch and also supply the following documents to them by Courier (or as instructed in the Contract), besides advance intimation by Fax / email:

(a) Clean on Board Airway Bill/Bill of Lading (B/L)

(b) Original Invoice

(c) Packing List (with item-wise gross and net weight)

(d) Certificate of Origin from Seller's Chamber of Commerce

(e) Certificate of pre-despatch inspection by BRBNMPL's representative/ nominee

(f) Certificate of Quality and current manufacture from OEM

(g) Dangerous Cargo Certificate, if any.

(h) Insurance Policy of 110% if CIP/CIF contract.

(i) Performance Bond / Warranty Certificate

15.4 **Receipt of Consignment - Preliminary Acknowledgement:** At the time of the delivery at the destination, the consignee shall receive the Goods on a "subject to inspection and acceptance in terms of contract" basis and shall issue the preliminary receipt to acknowledge having received the claimed quantity (not the quality) of consignment.

16. Warranty

16.1 In general, the supplier should warrant that the goods supplied under the contract is new, unused and incorporate all recent improvements in design and materials unless prescribed otherwise by BRBNMPL in the contract. The supplier should further warrant that the goods supplied under the contract shall have no defect arising from design, materials (except when the design adopted and/ or the material used are as per BRBNMPL's specifications) or workmanship or from any act or omission of the supplier, that may develop under normal use of the supplied goods under the conditions prevailing in India.

16.2 Unless otherwise specified in the SCC, this warranty shall remain valid for twelve months after the goods or any portion thereof as the case may be, have been delivered to the final destination and installed and commissioned at the final destination and accepted by BRBNMPL in terms of the contract or for fifteen months from the date of despatch from the supplier's premises for domestic goods (including goods already imported by the supplier under its own arrangement) or for eighteen months after the date of shipment from the port of loading in the source country for imported goods offered from abroad, whichever is earlier.

16.3 Obligations of the contractor under the warranty clause shall survive even though:

a) The Goods may have been inspected, accepted, installed/ commissioned and paid for by BRBNMPL.

b) The contract is terminated for any reason whatsoever.

16.4 BRBNMPL shall promptly notify in writing to the contractor, if during the period above, the said goods/stores/articles are discovered not to conform to the description and quality or have deteriorated, otherwise than by fair wear and tear (the decision of BRBNMPL in that behalf being final and conclusive).

16.5 Upon receipt of such notice, the supplier shall, with all reasonable speed (or within the period, if specified in the SCC or contract), repair or replace the defective goods or parts thereof, free of cost, at the ultimate destination. The supplier shall take over the replaced parts / goods after providing their replacements and no claim, whatsoever shall lie on BRBNMPL for such replaced parts/goods thereafter.

16.6 A penalty of 0.5% (half per cent) of the contract value for the delay in response time beyond specified time as detailed above shall be recoverable from the Performance/Warrantee Guarantee. The maximum penalty for warranty failure will be 5% (Five percent) of the contract value during the whole warranty period. If there is further such delay after reaching this limit, BRBNMPL shall be entitled to encashment of whole of Performance/ Warrantee Guarantee Bonds.

16.7 In the event of any rectification of a defect or replacement of any defective goods during the warranty period, the warranty for the rectified / replaced goods shall remain till the original warranty period.

16.8 If the supplier, having been notified, fails to rectify / replace the defect(s) within a reasonable period (or within the period, if specified in the SCC or contract), it shall amount to breach of Contract for default and BRBNMPL shall avail any or all remedial action(s) thereunder.

17. Assignment

17.1 The Supplier shall not sublet, transfer, or assign, either in whole or in part, its contractual duties, responsibilities and obligations to perform the contract, except with BRBNMPL's prior written permission.

18. Sub Contracts

18.1 The Supplier shall notify BRBNMPL in writing of all sub contracts awarded under the contract if not already specified in its tender. Such notification, in its original tender or later, shall not relieve the Supplier from any of its liability or obligation under the terms and conditions of the contract.

18.2 Sub contract shall be only for bought out items and incidental Works/ Services.

18.3 Sub contracts shall also comply with the provisions of GCC Clause 5 ("Country of Origin").

18.4 If the Contractor sublets or assigns this contract or any part thereof without such permission, the Procuring Entity shall be entitled, and it shall be lawful on his part, to treat it as a breach of contract and avail any or all remedies thereunder.

19. Modification of contract

19.1 Once a contract has been concluded, the terms and conditions thereof will generally not be varied. However, if necessary, BRBNMPL may suo-moto or, on request from the supplier, by a written order given to the supplier at any time during the currency of the contract, amend the contract by making alterations and modifications within the general scope of contract in any one or more of the following:

(a) Specifications, drawings, designs etc. where goods to be supplied under the contract are to be specially manufactured for BRBNMPL,

(b) mode of packing,

(c) incidental services to be provided by the supplier

(d) mode of despatch,

(e) place of delivery, and

(f) any other area(s) of the contract, as felt necessary by BRBNMPL depending on the merits of the case.

19.2 In the event of any such modification / alteration causing increase or decrease in the cost of goods and services to be supplied and provided, or in the time required by the supplier to perform any obligation under the contract, an equitable adjustment shall be made in the contract price and/ or contract delivery schedule, as the case may be, and the contract amended accordingly. If the supplier doesn't agree to the adjustment made by BRBNMPL, the supplier shall convey its views to BRBNMPL within twenty-one days from the date of the supplier's receipt of BRBNMPL's amendment / modification of the contract.

19.3 **Option Clause:** By a suitable provision in the SCC, the Purchaser may reserve the right to increase the ordered quantity by 25% at any time, till final delivery date of the contract, by giving reasonable notice even though the quantity ordered initially has been supplied in full before the last date of Delivery Period.

19.4 **Repeat Order:** By a suitable provision in the SCC, the Purchaser may reserve the right to procure additional 50% of the ordered quantity within 6 months from the date of last supply by placing repeat order against the previous order with same rate and terms and conditions. However, both optional quantity and repeat order quantity together shall not exceed 50% of the initial ordered quantity.

20. Prices

20.1 Prices to be charged by the supplier for supply of goods and provision of services in terms of the contract shall not vary from the corresponding prices quoted by the supplier in its tender or during negotiations, if any, and incorporated in the contract except for any price adjustment authorized in the SCC.

20.2 **Price Variation:** If the Price Variation clause is applicable as per the contract, the price shall be subject to adjustment to take care of the changes in the cost of labour, material, and fuel/power components as per the price variation formula specified therein.

20.3 **Exchange Rate Variation:** The offer of the tenderer should indicate import content and the currency used for calculating import content. The Base Exchange rate of each significant currency used for calculating the Foreign Exchange content of the contract shall be as prevailing on the last deadline for submission of Techno-commercial Bids, and variation beyond the base Exchange Rate shall be calculated up to the midpoint of the delivery period, unless firm has already indicated the time schedule within which material will be imported by the firm. In case delivery period is refixed / extended, ERV will not be admissible, if this is due to default of the supplier.

Documents for claiming ERV:

(i) A bill of ERV claim enclosing working sheet

(ii) Banker's Certificate/debit advice detailing F.E. paid and exchange rate prevailing on the date as applicable.

(iii) Copies of import order/agreement placed on supplier

(iv) Invoice of supplier for the relevant import order

21. Taxes and Duties

21.1 Supplier shall be entirely responsible for all taxes, duties, fees, levies etc. incurred until delivery of the contracted goods to BRBNMPL. Further instruction, if any, shall be as provided in the SCC.

21.2 If applicable under relevant tax laws and rules, BRBNMPL shall deduct from all payments and deposit required taxes to respective authorities on account of GST Reverse Charge Mechanism; Tax Deducted at Source (TDS), and Tax Collected at Source (TCS) relating to Income Tax, labour cess, royalty etc.

21.3 The payment of GST and GST Cess to the contractor shall be made only on the latter submitting a GST compliant Bill / invoice indicating the appropriate HSN code and applicable GST rate thereon duly supported with documentary evidence as per the provision of relevant GST Act and the Rules made there under. The delivery shall be shown being made in the name, location/ state, and GSTIN of the consignee only; the location of the procurement office of the procuring entity has no bearing on the invoicing.

21.4 The supply of Goods or services or both, if imported into India, shall be considered as supply under inter-state commerce / trade and shall attract integrated tax (IGST). The IGST rate and GST cess shall be applicable on the 'Custom Assessable Value' plus the 'Basic Customs duty applicable thereon'.

21.5 While claiming reimbursement of duties, taxes etc. (like GST) from the Procuring Entity, as and if permitted under the contract, the contractor shall also certify that in case it gets any refund out of such taxes and duties from the concerned

authorities at a later date, it (the contractor) shall refund to the Procuring Entity, the Procuring Entity's share out of such refund received by the contractor. The Contractor shall also refund the appropriate amount to the Procuring Entity immediately on receiving the same from the concerned authorities.

21.6 All necessary adjustment vouchers such as Credit Notes/ Debit Notes for any short/ excess supplies or revision in prices or any other reason under the contract shall be submitted to the Procuring Entity in compliance with GST provisions.

21.7 Liquidated damages or any other recoveries should be shown as deductions on the invoice, and GST shall be applicable only on the nett balance payment due.

21.8 In case of Price Variation or Exchange Rate variation, or any other variation is applicable, GST shall be applicable on the nett invoice value after the variation is taken into account.

21.9 GST shall be paid as per the rate at which it is liable to be assessed or has been assessed provided the transaction of the sale is legally liable to such taxes and is payable as per the terms of the contract subject to the following conditions:

(i) The Procuring Entity shall not pay a higher GST rate if leviable due to any misclassification of HSN number or incorrect GST rate incorporated in the contract due to contractor's fault. Wherever the contractor invoices the Goods at GST rate or HSN number, which is different from that incorporated in the contract, payment shall be made as per GST rate, which is lower of the GST rates incorporated in the contract or billed.

(ii) However, the Procuring Entity shall not be responsible for the contractor's tax payment or duty under a misapprehension of the law.

(iii) Bidder is informed that he shall be required to adjust his basic price to the extent required by a higher tax rate billed as per invoice to match the all-inclusive price mentioned in the contract.

(iv) In case of profiteering by the contractor relating to GST tax, the Procuring Entity shall treat it as a violation of the Code of Integrity in the contract and avail any or all punitive actions thereunder, in addition to recovery and action by the GST authorities under the Act.

(v) The contractor should issue Receipt vouchers immediately on receipt of all types of payments along with tax invoices after adjusting advance payments, if any, as per Contractual terms and GST Provisions.

(vi) Liquidated damages or any other recoveries should be shown as deductions on the invoice, and GST shall be applicable only on the nett balance payment due.

21.10 **Statutory Variation Clause:** Unless otherwise stated in the contract, statutory increase in applicable GST rate only during the original delivery period shall be to Procuring Entity's account. Any increase in the rates of GST beyond the original completion date during the extended delivery period shall be borne by the contractor. The benefit of any reduction in GST rate must be passed on to the Procuring Entity during the original and extended delivery period. However, GST rate amendments shall be considered for quoted HSN code only, against documentary evidence, provided such an increase of GST rates after the last date of bid submission.

21.11 **Duties/Taxes on Raw Materials:** The Procuring Entity is not liable for any claim from the contractor on account of fresh imposition and/ or increase (including statutory increase) of GST, customs duty, or other duties on raw materials and/ or components used directly in the manufacture of the contracted Goods taking place during the pendency of the contract unless such liability is expressly agreed to in terms of the contract.

22. **Terms and Mode of Payment:** Unless specified otherwise in SCC, the terms of payments would be as follows:

22.1 Unless otherwise specified in SCC, usual payment term is 100% on receipt and acceptance of goods by the consignee (Stores section) and on production of all required documents by the supplier.

22.2 **For Domestic Goods:** Unless otherwise specified in the SCC, payments to suppliers are usually made by account payee cheque or through ECS only. In case of non-payment through EFT, or where EFT facility is not available, payment may be released through cheque.

22.2.1 Where the terms of delivery is FOR dispatching Station, the payment terms, depending on the value and nature of the goods, mode of transportation etc. maybe 60% to 90% (as specified in SIT) on proof of dispatch and other related documents and balance on receipt at site and acceptance by the consignee (Stores section).

22.2.2 Where the terms of delivery is delivery at site / CIF Destination / FOR destination, usual payment term is 100% on receipt and acceptance of goods by the consignee (Stores section) and on production of all required documents by the supplier.

22.2.3 Where goods to be supplied also need installation and commissioning by the supplier, the payment terms are generally as under:

(a) For a contract with terms of delivery as FOR dispatching station

i. 60% on proof of dispatch along with other specified documents

ii. 30% on receipt of the goods at site by the consignee (Stores section) and balance

iii. 10% on successful installation and commissioning and final acceptance by the consignee (User department)

(b) For a contract with terms of delivery as Delivery at site/CIF Destination/FOR destination

i. 90% on receipt and acceptance of goods by the consignee (Stores section) at destination and on production of all required documents by the supplier

ii. 10% on successful installation and commissioning and final acceptance by the consignee (User department)

22.3 **For Imported Goods:** Unless otherwise specified in SCC, payments are made through an irrevocable Letter of Credit (LC).

(a) Cases where Installation, Erection and Commissioning (if applicable) **are not the responsibility of the Supplier** - 90% net FOB/FAS/ CFR/CIF/CIP price is to be paid against invoice, shipping documents, inspection certificate (wherever applicable), manufacturers' test certificate, etc. and balance 10% on receipt of goods and after ascertaining its suitability by the consignee (User department).

(b) Cases where Installation, Erection and Commissioning **are the responsibility of the Supplier** - 80% to 90% net FOB/FAS/CFR/CIF/ CIP price (as specified in the SCC) will be paid against invoice, inspection certificate (where applicable), shipping documents etc. and balance 10% - 20% within 21-30 days of successful installation and commissioning at the consignee's premises and final acceptance by the consignee (User department).

22.4 Unless specified otherwise in the SCC, the following general conditions will apply for payment to the supplier.

22.5 In Domestic Contracts, payments shall only be made in Indian Rupees. In Global Tenders, payment to foreign bidders shall be made in the currency/ currencies authorized in the contract.

22.6 The supplier shall send its claim for payment in writing as per Section XIX - "Proforma for Bill for Payments", when contractually due, along with relevant documents etc., duly signed with date, as specified in SCC and in a manner as also specified therein.

22.7 While claiming payment, the supplier is also to certify in the bill that the payment being claimed is strictly in terms of the contract and all the obligations on the part of the supplier for claiming that payment has been fulfilled as required under the contract.

22.8 The important documents which the supplier is to furnish while claiming payment are:

a) Original Invoice (GST compliant)
b) Packing List (with item-wise gross and net weight)
c) Certificate of country of origin of the goods from seller's Chamber of Commerce in case of imported goods
d) Certificate of pre-dispatch inspection by BRBNMPL's representative / nominee
e) Manufacturer's test certificate
f) Performance / Warrantee Bond
g) Certificate of insurance

h) Clean on Bill of lading / Airway bill / Rail receipt or any other dispatch document, issued by a government agency (like postal department) or an agency duly authorized by the concerned ministry / department

i) Consignee's Certificate confirming receipt and acceptance of goods in case of payment after receipt and acceptance

j) Dangerous Cargo Certificate, if any, in case of imported goods.

k) Any other document specified.

22.9 While claiming reimbursement of duties, taxes (like GST, Customs duty and any other similar duties and taxes) from BRBNMPL, as and if permitted under the contract, the supplier shall also certify that, in case it gets any refund out of such taxes and duties from the concerned authorities at a later date, it (the supplier) shall refund to BRBNMPL. The supplier shall also refund the applicable amount to BRBNMPL immediately on receiving the same from the concerned authorities.

22.10 In case where the supplier is not in a position to submit its bill for the balance payment for want of receipt copies of Inspection Note from the consignee and the consignee has not complained about the non-receipt, shortage, or defects in the supplies made, balance amount will be paid by the paying authority without consignee's receipt certificate after three months from the date of the preceding part payment for the goods in question, subject to the following conditions:

(a) The supplier will make good any defect or deficiency that the consignee (s) may report within six months from the date of despatch of goods.

(b) Delay in supplies, if any, has been regularized.

(c) The contract price where it is subject to variation has been finalized.

(d) The supplier furnishes the following undertakings:
"I/We, _____ certify that I/We have not received back the Inspection Note duly receipted by the consignee or any communication from BRBNMPL or the consignee about non-receipt, shortage or defects in the goods supplied. I / We agree to make good any defect or deficiency that the consignee may report within three months from the date of receipt of this balance payment or six months from the date of dispatch whichever is later."

22.11 **Withholding and lien in respect of sums claimed:** Whenever any claim or claims for payment of a sum of money arises against the contractor, out of or under the contract, BRBNMPL shall be entitled, and it shall be lawful on his part, to withhold and also have a lien to retain such sum or sums, in whole or in part pending finalisation or adjudication of any such claim from:

(i) any security or retention money, if any, deposited by the contractor.

(ii) any sum(s) payable till now or hereafter to the contractor under the same Contract or any other contract with BRBNMPL if the security is insufficient or if no security has been taken from the contractor.

22.12 **Payment Against Time-Barred Claims:** All claims against BRBNMPL shall be legally time-barred after three years calculated from the date when the payment falls due unless the payment claim has been under correspondence. BRBNMPL is entitled to, and it shall be lawful for it to reject such claims.

23. Delay in the supplier's performance

23.1 The time for and the date specified in the contract or as extended for the delivery of the stores shall be deemed to be the essence of the contract and the supplier shall deliver the goods and perform the services under the contract within the time schedule specified by BRBNMPL in the List of Requirements and as incorporated in the contract.

23.2 Subject to the provision under GCC clause 28, any unexcused delay by the supplier in maintaining its contractual obligations towards delivery of goods and performance of services shall render the supplier liable to any or all of the following sanctions besides any administrative action:

a) Imposition of liquidated damages,

b) Forfeiture of its performance security and

c) Termination of the contract for default.

23.3 If at any time during the currency of the contract, the supplier encounters conditions hindering timely delivery of the goods and performance of services, the supplier shall promptly inform BRBNMPL in writing about the same and its likely duration and make a request to BRBNMPL for extension of the delivery schedule accordingly. On receiving the supplier's communication, BRBNMPL shall examine the situation as soon as possible and, at its discretion, may agree to extend the delivery schedule, with or without liquidated damages for completion of supplier's contractual obligations by issuing an amendment to the contract.

23.4 When the period of delivery is extended due to unexcused delay by the supplier, the amendment letter extending the delivery period shall, inter alia contain the following conditions:

a) **Liquidated Damages:** BRBNMPL shall recover from the supplier, under the provisions of the clause 24 of the General Conditions of Contract, liquidated damages on the goods and services, which the Supplier has failed to deliver within the delivery period stipulated in the contract.

b) **Denial Clause:**

i. That no increase in price on account of any ground, whatsoever, including any stipulation in the contract for increase in price on any other ground and, also including statutory increase in or fresh imposition of customs duty, Goods and Services Tax or on account of any other duties and taxes which may be levied in respect of the goods and services specified in the contract, which takes place after the date of delivery stipulated in the contract shall be admissible on such of the said goods and services as are delivered and performed after the date of the delivery stipulated in the contract.

ii. Notwithstanding any stipulation in the contract for an increase in price on any other ground, including price variation clause or foreign exchange rate variation, or any other variation clause, no such increase after the original delivery date shall be admissible on such goods delivered after the said date.

iii. But nevertheless, BRBNMPL shall be entitled to the benefit of any decrease in price on account of reduction in or remission of customs duty, Goods and Services Tax or any other duty or tax or levy or on account of any other ground as stipulated in the price variation clause or foreign exchange rate variation or any other variation clause, which takes place after the expiry of the date of delivery stipulated in the contract.

23.5 The supplier shall not despatch the goods after expiry of the delivery period. The supplier is required to apply to BRBNMPL for extension of delivery period and obtain the same before despatch. In case the supplier despatches the goods without obtaining an extension, it would be doing so at its own risk and no claim for payment for such supply and / or any other expense related to such supply shall lie against BRBNMPL.

24. Liquidated damages

24.1 Subject to GCC clause 28, if the supplier fails to deliver any or all of the Goods or fails to perform the services within the time frame(s) incorporated in the contract, BRBNMPL shall, without prejudice to other rights and remedies available to BRBNMPL under the contract, deduct from the contract price, as liquidated damages, a sum equivalent to the 0.5% percent (or any other percentage if prescribed in the SCC) of the delivered price of the delayed goods and / or services for each week of delay or part thereof until actual delivery or performance, subject to a maximum deduction of the 10% (or any other percentage if prescribed in the SCC) of the delayed 'goods' or 'services' contract price(s). During the above-mentioned delayed period of supply and / or performance, the denial clause incorporated under GCC sub-clause 23.4 above shall also apply.

25. Custody and Return of BRBNMPL's Materials / Equipment / Documents loaned to Contractor

25.1 Whenever stores are required to be issued to the firm/contractor for fabrication or prototypes or sub-assemblies are issued for guidance in fabrication, these would be issued against appropriate Bank Guarantee as

specified in SCC. In addition to the Bank Guarantee, appropriate insurance may be asked if specified in the SCC.

25.2 All drawings and samples issued to the contractor in connection with the contract must be returned by him. Final payment will be withheld if this is not done, besides any other sanction deemed fit by BRBNMPL.

26. Breach of Contract - Termination for default

26.1 BRBNMPL, without prejudice to any other contractual rights and remedies available to it for breach of contract, such as removal from the list of registered supplier, may, by written notice of default sent to the supplier, terminate the contract in whole or in part:

(i) If the supplier fails to deliver any or all of the stores or services within the time period(s) specified in the contract, or any extension thereof granted.

(ii) If the supplier fails to perform any other obligation (including Code of Ethics or obligation to maintain eligibility and Qualifications based on which contract was awarded) within the period specified in the contract or any extension thereof granted.

(iii) If the supplier is found to have made any false or fraudulent declaration or statement to get the contract or he is found to be indulging in unethical or unfair trade practices.

(iv) When the item offered by the supplier repeatedly fails in the inspection and/or the supplier is not in a position to either rectify the defects or offer items conforming to the contracted quality standards.

(v) When both parties mutually agree to terminate the contract.

(vi) Any special circumstances, which must be recorded to justify the termination of a contract.

(vii) In pursuance of an award given by a Court of Law.

26.2 In the event BRBNMPL terminates the contract in whole or in part, pursuant to GCC sub-clause 26.1 above, BRBNMPL may take recourse to any one or more of the following actions:

(i) Invoke the performance security;

(ii) Invoke the risk purchase clause - BRBNMPL may procure goods and/ or services similar to those undelivered, with such terms and conditions and in such manner as it deems fit at the "Risk and Cost" of the supplier and the supplier shall be liable to BRBNMPL for the extra expenditure, if any, incurred by BRBNMPL for arranging such procurement;

(iii) Any other action as deemed appropriate.

26.3 Unless otherwise instructed by BRBNMPL, the supplier shall continue to perform the contract to the extent not terminated.

26.4 All warranty obligations, if any, shall continue to survive despite the termination.

26.5 **Limitation of Liability:** Except in cases of criminal negligence or wilful misconduct, the aggregate liability of the contractor to the Procuring Entity, whether under the contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the contractor to indemnify the Procuring Entity concerning IPR infringement.

27. Breach of Contract - Termination for insolvency

27.1 In the event the supplier becomes bankrupt or otherwise insolvent or loses substantially the technical or financial capability (based on which he was selected for award of contract) or liquidation proceedings are commenced against it by a third party or by own volition, BRBNMPL reserves the right to terminate the contract, at any time, by serving written notice to the supplier, without any adverse consequence to BRBNMPL and without being liable to pay any compensation, whatsoever, to the supplier, subject to further condition that such termination will not prejudice or affect any rights of action or remedies which have accrued or will accrue prior to termination or thereafter to BRBNMPL.

27.2 Upon such termination, BRBNMPL shall be deemed to be the owner of the stores/materials manufactured by the supplier and retain first right and lien over the stores/materials including the raw material purchased by the supplier for performance of the contract and require the stores/materials to be delivered under the contract, which is terminated on account of bankruptcy or insolvency or likely bankruptcy or insolvency of the supplier and such stores in possession of the supplier shall be earmarked and be delivered to BRBNMPL before the start of the bankruptcy or insolvency process.

27.3 In the event the supplier is aware or apprehends that it is likely to go into liquidation whether on account of liquidation proceedings commenced by a third party or by way of voluntary liquidation, then the supplier shall forthwith inform BRBNMPL as soon as it is aware that a third party has issued notice that it intends to commence liquidation proceedings or well before it files for liquidation.

27.4 **Escrow Arrangement**

(i) The Supplier shall deposit with a third party escrow agent mutually agreed to by the parties, a copy of Software and its source code and object code for safe keeping with instructions for it to be released forthwith to BRBNMPL, in the event the Supplier fails to make the source code/object code accessible to BRBNMPL whenever required and/or in the event the Supplier is likely to go into liquidation or goes into liquidation.

(ii) In the event, the Supplier apprehends that it is likely to go into liquidation whether on account of liquidation proceedings commenced by a third party or in the event it anticipates filing for bankruptcy, then the Supplier shall inform BRBNMPL in advance and engage with it to determine the sale and possession of BRBNMPL's software and its source code. In the event Supplier fails to do so, the third party escrow agent shall be instructed under the Escrow Agreement to release the Software and its source code to BRBNMPL as noted above.

(iii) For the purpose of this Clause, the term '*Software*' shall collectively mean, the full and final version of the Software to be delivered to BRBNMPL in source code and object code forms, together with any and all improvements, corrections, modifications, updates, enhancements or other changes, whether or not included in the full and final version including all System Documentation and User Documentation.

(iv) The term *'System Documentation'* shall mean any and all documentation used in the development and updating of the Software, including but not limited to, customer requirements and specifications design or development specifications, test and error reports, and related correspondence and memoranda. And the term '*User Documentation*' shall mean the end-user instruction manual that usually accompanies the Software instructing end users in the use of the Software in both printed and electronic form.

28. Force Majeure

28.1 In the event of any unforeseen event directly interfering with the supply of stores arising during the currency of the contract, such as war, hostilities, acts of the public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes, lockouts, or acts of God, the Contractor shall, within a week from the commencement thereof, notify the same in writing to the Purchaser with reasonable evidence thereof. Unless otherwise directed by BRBNMPL in writing, the supplier shall continue to perform its obligations under the contract as far as reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event. If the force majeure condition(s) mentioned above be in force for a period of 90 days or more at any time, either party shall have the option to terminate the contract on expiry of 90 days of commencement of such force majeure by giving 14 days' notice to the other party in writing. In case of such termination, no damages shall be claimed by either party against the other, save and except those which had occurred under any other clause of this contract prior to such termination.

28.2 Notwithstanding the provisions contained in GCC clauses 23, 24 and 26, the supplier shall not be liable for imposition of any such sanction so long the delay and / or failure of the supplier in fulfilling its obligations under the contract is the result of an event of Force Majeure.

28.3 In case due to a Force Majeure event BRBNMPL is unable to fulfil its contractual commitment and responsibility, BRBNMPL will notify the supplier accordingly and

subsequent actions taken on similar lines described in above sub-paragraphs.

29. Termination for convenience

29.1 BRBNMPL reserves the right to terminate the contract, in whole or in part for its (BRBNMPL's) convenience, by serving written notice on the supplier at any time during the currency of the contract. The notice shall specify that the termination is for the convenience of BRBNMPL. The notice shall also indicate inter-alia, the extent to which the supplier's performance under the contract is terminated, and the date with effect from which such termination will become effective.

29.2 The goods and services which are complete and ready in terms of the contract for delivery and performance within thirty days after the supplier's receipt of the notice of termination shall be accepted by BRBNMPL following the contract terms, conditions and prices. For the remaining goods and services, BRBNMPL may decide:

a) to get any portion of the balance completed and delivered at the contract terms, conditions and prices; and / or

b) to cancel the remaining portion of the goods and/or services and compensate the supplier by paying an agreed amount for the cost incurred by the supplier towards the remaining portion of the goods and/or services.

30. Fall Clause

This clause shall be applicable only if explicitly invoked in SCC. Nevertheless, Fall Clause shall be expressly applicable in case of Rate Contract.

30.1 The price charged for the Goods supplied under the contract by the contractor shall in no event exceed the lowest price at which the contractor sells the Goods or offers to sell Goods of identical description, to any persons/organisations including the Procuring Entity or any Department or Undertaking of the Central Government, as the case may be during the currency of the contract. Contractor shall forthwith notify such reduction or sale or offer of sale to the Procuring Entity and the price payable under the contract for the Goods supplied after the date of coming into force of such reduction or sale or offer of sale shall stand correspondingly reduced.

30.2 The above stipulation shall, however, not apply to:

(i) Exports by the contractor

(ii) Sale of Goods as original equipment at prices lower than the prices charged for normal replacement

(iii) Sale of perishable Goods having a limited shelf life, such as drugs that have expiry dates

30.3 The contractor shall furnish the following certificate with each bill for payment of supplies made against the contract.

"We certify that there has been no reduction in the sale price of the Goods of description identical to the Goods supplied to BRBNMPL under the contract herein, and such Goods have not been offered/sold by me/us to any person/organisation including any Ministry/ Department/Attached and Subordinate Office/Public Sector Undertaking of Central or State Government(s) as the case may be upto the date of bill / the date of completion of Contract at a price lower than the price charged under this contract except for the quantity of Goods categories under (i), (ii) and (iii) of sub-clause (30.2) above, details of which are as follows:-"

31. Notices

31.1 Notice, if any, relating to the contract given by one party to the other, shall be sent in writing or by cable or telex or facsimile and confirmed in writing, the procedure will also provide the sender of the notice, the proof of receipt of the notice by the receiver. The addresses of the parties for exchanging such notices will be the addresses as incorporated in the contract.

31.2 The effective date of a notice shall be either the date when delivered to the recipient or the effective date specifically mentioned in the notice, whichever is later.

32. Code of Ethics, Obligations, Penalties and Punishments

32.1 Code of Ethics: Officers and staff of BRBNMPL as well as Bidders, Suppliers, Contractors, and Consultants under BRBNMPL contracts shall observe the highest standard of ethics and should not indulge in following prohibited practices, either directly or indirectly, at any stage during the procurement process or during execution of resultant contracts:

(i) **"Corrupt practice"** making offer, solicitation or acceptance of bribe, reward or gift or any material benefit, in exchange for an unfair advantage in the procurement process or to otherwise influence the procurement process;

(ii) **"Fraudulent practice"** any omission, or misrepresentation that may mislead or attempt to mislead so that financial or other benefit may be obtained, or an obligation avoided. This includes making false declaration or providing false information for participation in a tender process or to secure a contract or in execution of the contract;

(iii) **"Anti-competitive practice"** - any collusion, bid rigging or anti-competitive arrangement, or any other practice coming under the purview of The Competition Act, 2002, between two or more bidders, with or without the knowledge of the procuring entity, that may impair the transparency, fairness, and the progress of the procurement process or to establish bid prices at artificial, non-competitive levels;

(iv) **"Coercive practice"** harming or threatening to harm, persons, or their property to influence their participation in the procurement process or affect the execution of a contract;

(v) **"Conflict of interest"** – participation by a bidding firm or any of its affiliates who are either involved in the Consultancy Contract from which particular procurement is linked; or if they are part of more than one bid in the procurement; or if their personnel have relationship or financial or business transactions with any officer in Procuring entity, who are directly or indirectly related to tender or execution process of contract; or improper use of information obtained by the (prospective) bidder from the procuring entity with an intent to gain unfair advantage in the procurement process or for personal gain; and

(vi) **"Obstructive practice"** - materially impede procuring entity's investigation into allegations of one or more of the above mentioned prohibited practices either by deliberately destroying, falsifying, altering; or by concealing of evidence material to the investigation; or by making false statements to investigators and/or by threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or by impeding the procuring entity's rights of audit or access to information;

32.2 Obligations for proactive disclosures:

(i) Procuring authorities as well as bidders, suppliers, contractors, and consultants, are obliged under this Code of Ethics to suo-moto proactively declare any conflict of interest (coming under the definition mentioned above – pre-existing or as and when these arise at any stage) in any procurement process or execution of contract. Failure to do so would amount to violation of this code of ethics.

(ii) Any bidder must declare, whether asked or not in a bid document, any previous transgressions of such code of ethics with any entity in any country during the last three years or of being debarred by any other procuring entity. Failure to do so would amount to violation of this code of ethics.

32.3 Penalties and Punishments

A particular violation of ethics may span more than one of above-mentioned unethical practices. Without prejudice to and in addition to the rights of the procuring entity to other penal provision as per the bid-documents or Contract, If the Procuring Entity comes to a conclusion that a (prospective) bidder or contractor directly or through an agent has violated this Code of Ethics in competing for the contract or in executing a contract, the Procuring Entity may take appropriate measures including:

32.3.1 if his bids are under consideration in any procurement

(i) Rejection and exclusion of the bidder from the procurement process;

(ii) Calling off of any pre-contract negotiations and forfeiture or encashment of bid security;

(iii) Forfeiture or encashment of any other security or bond relating to the procurement;

(iv) Cancellation of the relevant contract and recovery of compensation for loss incurred by the procuring entity;

(v) Recovery of payments made by the procuring entity along with interest thereon at prevailing rate;

(vi) Holiday Listing, Removal from the list of approved vendors and banning/debarment of the bidder from participation in future procurements of the procuring entity for a period not less than one year;

(vii) In case of Anti-competitive practices, information for further processing may be filed with the Competition Commission of India.

(viii) Initiation of suitable disciplinary or criminal proceedings against any individual staff found responsible.

33. Resolution of disputes

In case of any dispute or difference or question arising out of or in connection with or in relation to the contract or related documents, including, without limitation, their existence, interpretation, performance, or termination (whether during the course of supply or after its completion and whether before or after the determination, abandonment or breach of contract), the Parties (the PURCHASER and the SELLER) shall endeavor to settle such disputes or differences amicably in the following manner:

33.1 Adjudication

After exhausting efforts to resolve the Dispute with the Purchasing Officer executing the contract on behalf of the Procuring Entity, the contractor shall give a 'Notice of Adjudication' specifying the matters which are in question, or subject of the dispute or difference indicating the relevant contractual clause, as also the amount of claim item-wise to Head of Procurement or any other authority mentioned in the contract (hereinafter called the "Adjudicator") for invoking resolution of the dispute through Adjudication. During his adjudication, the Adjudicator shall give adequate opportunity to the contractor to present his case. Within **60** days after receiving the representation, the Adjudicator shall make and notify decisions in writing on all matters referred to him. The parties shall not initiate, during the adjudication proceedings, any conciliation or arbitral or judicial proceedings in respect of a dispute that is the subject matter of the adjudication proceedings. If not satisfied by the decision in adjudication, or if the adjudicator fails to notify his decision within the abovementioned time-frame, the contractor may proceed to invoke the process of Conciliation.

33.2 Conciliation through Expert Settlement Committee (ESC)

If the Parties fail to resolve their dispute or difference by Adjudication then either Party can send a notice invoking Conciliation through an Expert Settlement Committee (ESC) to the other Party within **15** days from the date of failure to resolve the dispute. The date of the last meeting held in the process of Adjudication shall be taken as date of failure to resolve the dispute through mutual consultation. The other Party shall have to respond within **15** days from the date of receipt of notice invoking Conciliation.

33.3 Arbitration

(i) If the Parties fail to reach an amicable settlement through the processes of Mutual Consultation and Conciliation through ESC, then either Party (the PURCHASER or the SELLER) may within thirty (30) days of such failure give a written notice to the other Party requiring that all matters in dispute or difference or in question be arbitrated upon in accordance with The Arbitration and Conciliation Act 1996.

(ii) Only the matters specified in such written notice which are in question or subject of dispute or difference, as also the amount of claim / counter-claims, shall be referred to the arbitration and no other matter which has not been specified shall be referred to the arbitration.

(iii) The claims and counter claims raised by the Parties at the time of invocation of the arbitration shall be final and binding on the Parties and no change shall be allowed in the same at any stage during arbitration under any circumstances. Withdrawal of claims/counter claims may however be done by the Parties at any stage.

(iv) The matters in dispute or difference or in question may be referred by either Party to a sole Arbitrator if the total value of the claim/counter-claim is up to ₹50 lakh and to a panel of three Arbitrators if the total value of claim/counter-claim is more than ₹50 lakh. For this purpose, BRBNMPL shall maintain a panel of qualified and experienced persons who will function as Arbitrators.

(v) **Appointment of Sole Arbitrator:** MD, BRBNMPL shall appoint the Sole Arbitrator from its panel of Arbitrators with the written consent of the other Party. The complexities of the dispute, the qualification and the experience of the person shall be kept in view while making such appointment. The award of the sole Arbitrator shall be final and binding on all parties.

(vi) **Appointment of three Arbitrators:** MD, BRBNMPL shall appoint an Arbitrator from its panel of Arbitrators. The complexities of the dispute, the qualification and the experience of the person shall be kept in view while making such appointment. Likewise, the other Party shall appoint its Arbitrator. The two Arbitrators so appointed shall appoint the third Arbitrator, who will be the Presiding Arbitrator. The decision of the majority of the Arbitrators shall be the Award of the Arbitral Tribunal and shall be final and binding on all parties.

(vii) The Arbitrator or Arbitrators appointed under this clause shall have the power to extend the time to make the award with the consent of the Parties as per the Arbitration and Conciliation Act, 1996 as amended till date. The fees of Arbitrator(s) and all other incidental cost incurred during the arbitration proceedings shall be borne equally by the parties.

(viii) The arbitration proceeding shall be held in Bengaluru or any other place in India as decided by the PURCHASER and shall be conducted in English language. All documentation to be reviewed by the Arbitrators and / or submitted by the Parties shall be written or translated into English.

(ix) The Arbitration Proceedings shall be governed by The Arbitration and Conciliation Act 1996, as amended from time to time including provisions in force at the time the reference is made.

(x) Pending reference to arbitration, the Parties shall continue to perform their contractual obligations under the Agreement and disputes or differences or questions, if any, will finally be settled in the arbitration.

34. Jurisdiction

Notwithstanding any other Court or Courts having jurisdiction to decide the question(s) forming the subject matter of the reference, if the same had been the subject matter of a suit, any and all actions and proceedings arising out of or relating to the contract or any Award arising therefrom, shall lie only in the Court of competent civil jurisdiction in this behalf at Bengaluru/Kolkata and only the said Court(s) at Bengaluru/Kolkata shall have jurisdiction to entertain and take any such actions and/or proceedings to the exclusion of all other Courts.

35. Governing Law

The Contract shall be governed in all respects by the by the laws of the Republic of India for the time being in force without application of the doctrine of Renvoi.

35. Secrecy

35.1 If the Contract declares the subject matter of this Contract as coming under the Official Secrets Act, 1923 or if the contract is marked as "Secret", the Contractor shall take all reasonable steps necessary to ensure that all persons employed in any work in connection with the contract, have full knowledge of the Official Secrets Act and any regulations framed thereunder.

35.2. Any information obtained in the course of the execution of the contract by the Contractor, his servants or agents or any person so employed, as to any matter whatsoever, which would or might be directly or indirectly, of use to any enemy of India, must be treated secret and shall not at any time be communicated to any person.

35.3. Any breach of the aforesaid conditions shall entitle the Purchaser to cancel the contract and to purchase or authorise the purchase of the stores at the risk and cost of the Contractor, In the event of such cancellation, the stores or parts manufactured in the execution of the contract shall be taken by the Purchaser at such price as he considers fair and reasonable and the decision of the Purchaser as to such price shall be final and binding on the Contractor.

Part II: Additional General Conditions of Contract for specific Types of Tenders in addition / modification to clauses mentioned above:

36. Disposal / Sale of Scrap by Tender

36.1 During the currency of contract, no variation in price or rate shall be admissible.

36.2 Payment and Default

36.2.1 Payment may be made in the form of Account Payee Demand Draft drawn on any scheduled commercial bank in India in favour of Bharatiya Reserve Bank Note Mudran Private Limited or through Online Transfer or through other Electronic Mode of Payment as mentioned in the NIT.

36.2.2 No interest will be paid to the purchaser for the amounts paid or deposited with the BRBNMPL and subsequently found refundable to the purchaser under any of the conditions of the contract.

36.2.3 If the purchaser fails to deposit sale value for a sold lot within the allowed period as per relevant clause BRBNMPL may forfeit the security deposit. Requests for an extension of this period, made by the purchaser may be considered by the BRBNMPL and may at its discretion, on the merits of the case, allow further time not excluding 50 days from the date of the contract. Interest shall be leviable on such amount at a rate 2% per annum higher than the PLR of State Bank of India, from the date of expiry of the payment date to actual date of payment (actual date of payment inclusive).

36.2.4 The lot or lots in respect of which forfeiture has been made, shall be deemed to have been abandoned by the purchaser to all intents and purposes and may be re-sold or otherwise disposed of at the discretion of the BRBNMPL without reference to the purchaser concerned and without incurring any liability on part of BRBNMPL whatsoever in respect there under.

36.2.5 In case extension is granted by BRBNMPL and due to late payment of sale amount the delivery cannot be completed by the purchaser, in accordance with the relevant clause of Special Conditions of Tender sale, then ground rent shall also be leviable as per relevant clause of Special Conditions of Tender sale.

36.2.6 On production of proof of having made payment, nominated authority shall issue a delivery order authorizing the purchaser to take delivery of the Scrap Materials.

36.3 Deliveries, Delays and Breach of Contact

36.3.1 The Title of goods or material sold shall not be deemed to have been passed to the Purchaser / Bidder until and unless the full and final payment has been made by the purchaser, in accordance with the contract to the BRBNMPL and the authorized Officer has issued the Delivery Order in favour of the purchaser.

The materials sold may be removed from the premises only on production of the cash receipt for the payment and a delivery order from the Officer authorized by the BRBNMPL.

36.3.2 Unless specified otherwise in SIT, delivery period for lifting of material shall be within 60 days from the date of finalization of contract agreement.

36.3.3 The work of delivery will be supervised by Stock Holder or his authorized representative, representative of accounts Department and Security Staff duly authorized by BRBNMPL for the propose of delivery. Delivery will be allowed during working hours.

36.3.4 No delivery of materials sold shall be given on Sundays, Gazetted holidays and other shall holidays observed by BRBNMPL. The delivery of the goods or material shall be effected from the premises concerned only during its normal working hours. In order to complete the delivery within the working hours all loading must cease half an hour before the normal closing time of the concerned premises. The decision of the BRBNMPL with regard to the working hour shall be final and binding on the purchaser. Purchaser will not be allowed to lift the Scrap Material from more than one location at a time.

36.3.5 The purchased stores will be carried away by the purchaser at his risk and no claims against the BRBNMPL will be entertained for shortage in weight which may be discovered after the materials have left the premises wherefrom delivery is taken. If required the purchaser shall provide his own bags, cases or other receptacles for the removal of the scrap.

36.3.6 The BRBNMPL shall not be responsible for any accident that may occur to purchaser's labours/servants for any reasons whatsoever. The purchaser will himself have to ensure the safety of his workers and shall be liable to pay claims, whatsoever if any. BRBNMPL will not carry any responsibility of such payments. The purchaser will be responsible to supply personal protection equipment to his labour/servant and staff and no additional charges are admissible for the same.

36.3.7 The materials sold, shall be removed by the purchaser within the period specified in relevant clause of Special Condition of Sale.

36.3.8 If due to any default on the part of the BRBNMPL, the purchaser is unable to remove the materials sold within the specified period, the BRBNMPL may extend the period therefore and in such an event purchaser will be entitled to take delivery of the goods or the materials sold within such extended Delivery period.

36.3.9 If contractor fails to lift sold scrap within the specified period, penalty shall be levied at the rate of 0.5% per day of the value of un-removed Scrap. Moreover the material shall remain at the purchaser's risk until removal thereof. Further BRBNMPL will be entitled to charge the ground rent as stated in relevant Para of SCC, for the area in which the materials sold are kept or stored - which would be recovered by the BRBNMPL from the Purchaser before removal of the material and in the event of default in payment thereof, the BRBNMPL at may its discretion shall be entitled to order the re-sale of such materials and forfeit the Security deposit or sale amount or both, paid by the purchaser.

36.3.10 If the purchaser makes slow progress with his contract and the BRBNMPL is of opinion that he may fail to fulfil the contract within the time specified in the conditions of sale, it will be lawful for the BRBNMPL to cancel the whole contract or such portion thereof as may not have been completed and the BRBNMPL shall be at liberty to dispose of the goods in any manner at the risk and expense of the purchaser.

36.3.11 The purchaser will have to comply with the provisions of the Contract Labour (Regulations and Abolition Act 1970 and Central Rules 1971 and obtain license from the Assistant Labour Commissioner or the competent authorities empowered to issue such license. Any failure on the part of the purchaser in this regard will be at his risk and consequences. He shall comply with Workman's Compensation Act 1923, Payment of Wages Act 1936, and Minimum Wages Act, 1948 and all the other related statutory and legal provisions and obligations, the purchaser shall also indemnity the BRBNMPL against any claim / liabilities that may occur to the contractor's labours and servants due to any reasons whatsoever.

36.3.12 If the purchaser makes default in complying with any of the condition of the contract, the sale of lot or lots in respect of which such default is made may be cancelled and such lot or lots may be put up again for sale and in such an event if a lower price is offered and accepted for such lot or lots then the purchaser shall be liable to pay the difference in price thereof together with all expenses occasioned by such resale in default to the BRBNMPL provided further that the purchaser in default shall not be entitled to claim any profit which may arise from such resale.

****

भाग /Section V: संविदा की विशेष शर्तें / Special Conditions of Contract (SCC)

The following Special Conditions of Contract (SCC) will apply for this purchase. The corresponding clauses of General Conditions of Contract (GCC) relating to the SCC stipulations have also been incorporated below. These Special Conditions will modify / substitute / supplement the corresponding (GCC) clauses.

Whenever there is any conflict between the provision in the GGC and that in the SCC, the provision contained in the SCC shall prevail.

(Clauses of GCC listed below include a possibility for variation in their provisions through SCC. There could be other clauses in SCC as deemed fit).

Sl. No	**GCC Clause No.**	**Topic**	**SCC Provision**
1.	1 to 4	Definitions; Interpretation and Abbreviations, Application, Use of contract documents and information, Patent Rights	No change
2.	5	Country of Origin	Applicable. In addition, A bidder is permitted to procure raw material, components, subassemblies etc. from the vendors from countries which share a land border with India. Such vendors will not be required to be registered with the Competent Authority as it is not regarded as "sub-contracting" However, in case a bidder has proposed to supply finished goods procured directly / indirectly from the vendors from the countries sharing land border with India, such vendor will be required to be registered with the Competent Authority. The Competent Authority for registration will be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT).
3.	6.1, 6.3, 6.5	Performance Bond / Security Deposit	**No Relaxation for bidder of any Stature** Within **21 days** after issue of Work Order/ Notification of Award/Letter of Intent by BRBNMPL, Performance Security is to be submitted for an amount equal to **Ten per cent (10%)** of the total value of contract (as per as per latest amendment to Rule 171(i) of GFR). Further, in case there is any amendment to the contract, GCC clause 6.4 shall be applicable. In case Security Deposit / Performance Bond is to be submitted in the form of Bank Guarantee, the same should be in the name of "Bharatiya Reserve Bank Note Mudran Private Limited" and should be

			valid up to Sixty days after date of completion of all contractual obligations **including Warranty & Defects Liability Period (DLP) obligations i.e., after 01 (One) Year.** Format of Bank Guarantee (BG) shall be as per Section-XV (Bank Guarantee Form for Performance Security). In case of failure of the contractor to execute the contract within the contract period, the security deposit shall be forfeited and the decision of BRBNMPL in this shall be final and binding. Performance Security shall be released without any interest after successful completion of all contractual obligations **including Warranty & Defects Liability Period (DLP) obligations i.e., after 01 (One) Year and on submission of "No Demand" Certificate.**
4.	7 to 15	Technical Specifications and Standards, Packing and Marking, Inspection and Quality Control, Terms of Delivery, Transportation of Goods, Insurance, Spare parts, Distribution of Dispatch Documents for Clearance/ Receipt of Goods	No change
5.	16.2	Warranty Clause	Defects Liability Period (DLP): **Minimum 01 (One) Year** from the date of successful completion of the work. Any defect/s recorded during DLP, shall be rectified / replaced by the Contractor without any extra cost to BRBNMPL. If the Contractor fails to do so, within 02 (two) weeks after information, BRBNMPL reserves the right to rectify the same through another agency & the cost incurred thus shall be recovered from the Contractor.
6.	18	Sub-contracts	Not applicable
5	19.3, 19.4	Modification of Contract	**19.3 Option Clause – Applicable** BRBNMPL reserves the right to place an additional Order at same rate, terms & conditions for maximum 25% of the Contract Value till final time schedule of the Contract. Further, it may be noted that the quantity against each line item of BOQ shall not be increased by more than 25% (Refer clause No. 19.3 of GCC, Section IV). **19.4 Repeat Order – Not Applicable**
6	20.2	Price Variation Clause	Not applicable
7	21.2	Taxes and Duties	No Change

8	22, 22.1, 22.2, 22.3, 22.4, 22.6	Terms and Mode of Payment	**Payment Terms:** i. **No advance payment shall be made.** ii. **Payment shall be done as per actual work carried out.** The Contractor shall not be paid any mobilization advance or any secured advance. iii. Payment shall be released through RTGS/ NEFT only. Bank Mandate as per as per Annexure 11, if not submitted earlier, should be submitted along with Technical Bid. Statutory Deductions as applicable will be deducted from the gross bill amount. iv. Bank charges on DD, Online Bank Transfer through RTGS/NEFT or Other Electronic Modes of Payment to be borne by the bidder/ Contractor only. v. No payment shall be released against the extra materials brought to the site. vi. Bidder has to furnish the price-break-up including the tax components. vii. The value of work done, less recovery if any will be payable as per progress of work as running account bills subject to satisfactory completion of work as per Joint measurements entered in the Measurement Book (MB) and the same entered in excel sheets to be submitted for certification to BRBNMPL Official. Deductions will comprise the deductions as stipulated including statutory deduction. viii. All progress payments made / R/A bills paid shall be regarded as payment by way of advance against final payment only and not as payment for the work completed. ix. All R/A bills / invoices for progress payments as well as for final payments shall be submitted in prescribed computerized forms supported by detailed measurement of items of work as per measurement books. x. The minimum value of interim bill/monthly bill/progressive running account (R/A) bill shall not be less than ₹**30.00 Lakhs (Rupees Thirty Lakhs).** xi. Bill in duplicate addressed to The Senior General Manager may be submitted at the end of successful completion of work along with soft copies through e-mail along with latest copy of GST return. **Final Bill:** Successful Bidder shall submit final bill within 02 (two) months from the date of completion of the works. The final bill submitted

			by the Bidder shall be processed for payment only after receipt of "No Demand" Certificate, Undertaking for Statutory Compliances and clearance of site of all rubbish, debris, vats, tanks, materials, temporary structures, Township and machinery and handing over the site in a tidy and clean condition to BRBNMPL and any other document required by BRBNMPL. The Contractor shall not be entitled for the payment for the quantities beyond the tendered quantities unless ordered for by specific written instructions from BRBNMPL.
9	23	Delay in the supplier's performance	Below is in addition to GCC Clause No. 23. Extension of time will only be considered, if in the opinion of BRBNMPL, the works be delayed (a) by force majeure or (b) by reason of any exceptionally inclement weather or (c) by reason of proceedings taken or threatened by or dispute with adjoining or neighbouring or public authorities arising otherwise than through the Contractor's own default or (d) by the works or delays of other Contractors or Tradesmen engaged or nominated by the Owner and not referred to in the schedule of quantities and/or specification or (e) by reason of BRBNMPL instructions as per relevant clause hereof or (f) by reason of civil commotion (g) by reason beyond control of the Contractor in the opinion of BRBNMPL. If the Contractor needs an extension of time for completion of the work, the Contractor shall apply at least 02 (Two) weeks before the expiry of schedule date of completion furnishing the reasons in detail with complete justification. The Contract shall remain in force even for the period beyond due date of completion irrespective of whether the Contractor has applied for extension of time for completion unless BRBNMPL decides to terminate the contract. The delay for completion of work for any reason will not entitle the Contractor to claim any compensation.
10	33.1	Resolution of Disputes	Clause 33.2 Place of arbitration proceeding shall be Bengaluru.
11	34-35	Applicable Law, Secrecy	No change
12	36, 36.3.2, 36.3.9	Disposal / Sale of Scrap by Tender	Not applicable

Note: Please read the GCC carefully before submitting the offer.

1. **Tender Evaluation:**
   i) **The evaluation shall be based on overall L1 basis considering the Total Cost including GST.** However, BRBNMPL does not pledge itself to accept the lowest or any tender and reserves to itself the right of accepting the whole or any part of the tender or portion of the quantity tender or cancel the tender without assigning any reason what so ever.
   ii) BRBNMPL shall evaluate the bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed and whether the bids are generally in order.
   iii) Quoted price should be in words and figures. Any discrepancy between words and figures, the price in words shall prevail. Insertions, postscripts, additions and alterations shall not be recognized, unless authenticated by the tenderer's signature. In case of discrepancy between unit price and total price/cost, the unit rate will be considered for evaluation.
   iv) All decisions by BRBNMPL on the evaluation of bids will be final and binding on the Bidders and is not subject to any scrutiny
   v) Any effort by a bidder to influence BRBNMPL personnel or representatives on matters relative to the bid under study in the process of examination, clarification, evaluation and comparison of bids, and in decisions concerning award of contract may result in rejection of his bid
2. The successful tenderer must note that all performance of the job shall be strictly in accordance with the requirements and fulfilments of the local/public authorities, statutory approvals and to the requirements of BRBNMPL and no deviation on any account will be permitted.
   BRBNMPL's representative reserves the right to execute any delayed services through third parties and deduct from contractor the cost of these services together with 10% of this cost for the damages, without any consent of contractor, who shall be notified in writing of the measures taken in every case, after giving due notice and Contractor continues to fail to carryout rectifications/execution of services.
   Any damages / breakdowns arising out of negligence, improper handling or improper maintenance will be viewed seriously. In such case the entire expenditure incurred for rectifying or replacing the damaged items will be borne by the contractor. The amount determined by BRBNMPL shall be final and binding. The contractor shall indemnify to this effect.
   The payment or deduction of such damages shall not relieve contractor from his obligations to complete the services or from any of his other obligations and liabilities under this Contract.
   The period of failure to carry out and all matters of delay, damages, unsatisfactory performance of the services mentioned in several clauses above shall be as determined and judged by the BRBNMPL whose decision shall be final and binding on the Contractor.
3. Superintendence – Contractor shall provide all necessary superintendence as necessary for the proper fulfilling of Contractor's obligations under this Contract.
4. BRBNMPL shall have the right to check and make remarks on any or all procedures proposed to be adopted by Contractor for the performance of services. Contractor shall submit such work procedure for BRBNMPL's review and approval.
5. Responsibility of the contractor
   a. The contractor should comply with all security procedures adopted by us and they should furnish the list of people deployed for this contract for verification to our Security Manager. Gate passes will be issued to the personnel deployed & it should be renewed periodically.
   b. Supervision: The Contractor or his supervisor should be present at the work spot and supervise during shifts in all working days. The Contractor should take and observe all the required formalities like deployment of his labourers, maintaining of attendance as directed by the Authorised persons of BRBNMPL. Any untoward incident arising out of

improper supervision or inadequate safety measures will be the sole responsibility of the Contractor and shall confirm to all the labour Laws and shall remain solely responsible for the obligation under the relevant statutory provisions.

c. The Contractor/Agency shall indemnify the Company from any claims/liability due to any breach of the statutory requirements from him/them. The Company as a principle Employer shall enforce the provisions of the Acts.
d. Adequacy of Contractor's Staff: It is essential that the service activities are to be performed with utmost diligence and expediency so as to maintain the highest standards of Maintenance. To achieve this, Contractor shall maintain adequate level of staff of good technical competence at site at all times.
e. Failure of Contractor to comply with the instructions of BRBNMPL may be grounds for determination by BRBNMPL that Contractor is not proceeding with the performance of services with due diligence to ensure fulfilment of contractual requirements.

6. Conditions of Performance: the contractor should confirm and assure that:
   a. Contractor has the requisite skilled and qualified personnel to perform the services.
   b. Contractor has inspected the premises and is familiar with the conditions related to performance of the services.
   c. Contractor shall at all times ensure that the supply of know-how, Manpower, Materials, Equipment, Tools and Tackles shall be adequate to satisfactorily undertake the scope of services without delay.
   d. Contractor shall at all times ensure that the services are being carried out in the most expeditious efficient manner consistent with the best interests of BRBNMPL, and in good and professional manner and in accordance with sound industry practice.
   e. Contractor shall perform and provide the services in accordance with provisions of this Contract and shall exercise all reasonable skill, care diligence and judgment in performance of the services.

   Contractor shall discuss as per the Contract, the general basis for execution of services, Contractor shall provide procedures for BRBNMPL approval which shall be based upon good engineering practice in order to maintain the services/equipment at a high level of efficiency and to provide safe working conditions. If any question arises between Contractor and BRBNMPL regarding particular work procedure followed or proposed to be followed by Contractor, Contractor must justify to BRBNMPL the soundness of such procedure and shall obtain BRBNMPL's written approval before the same may be affected. Provision or otherwise of such approval shall not relieve Contractor of any of its obligations under this Contract.

   BRBNMPL shall have the right to check and make remarks on any or all procedures proposed to be adopted by Contractor for the performance of services. Contractor shall submit such work procedure for BRBNMPL's review and approval.

7. Force Majeure Clause:

   BRBNMPL shall in addition to its power under other clauses to determine Purchase orders have power to terminate its liability there under at any time by giving a notice of reasonable time in writing to the supplier of the company's desire to do so and upon the expiration of the notice the P.O /W.O shall be determined without prejudice to the rights of the parties accrued to the date of determination.

   Further in the event of any situation arising out of or caused by any act which is beyond the control of BRBNMPL, which results in stoppage of production, or in event of any policy decision made in the interest of the company which may necessitate the short closure of the Purchase order, the company by giving a notice of reasonable time to supplier, can terminate the purchase order without prejudice to the rights of the parties accrued to the date of termination

8. Conflict of Interest:
   a. Contractor shall conduct its operations in a lawful manner consistent with good international practices and standards for such type of services.

b. Neither Contractor nor any of its subsidiaries or affiliates shall in connection with the services enter into a contract, give an undertaking, bid, enter into a Joint Venture Partnership, have any relations with a Third Party or any other arrangement to perform any services, to supply goods or equipment which may be to BRBNMPL's detriment.
c. Any treasures, antiques, valuable etc. found during excavation belong to the BRBNMPL & same shall be handed over without causing any damage to them.
d. The Contractor must ensure that at no point of time should any system be rendered non-functional.
e. Communication and Document distribution pertain to respective specialized works shall be made during execution of work to meet the requirement of the BRBNMPL.
f. Details of the service infrastructure in terms of the service staff strength and their qualifications, details of warehousing facilities for spares and the value of spares stocked shall be submitted.

B. Payment Terms and Conditions:

1. **Detailed procedure for payment of bills:** The procedure for maintenance of records of detailed measurements and payment of bills shall be as below:

   The payment for all works done shall be made on the basis of detailed measurements recorded in accordance with the stipulations spelt out in the relevant I.S. Codes. The measurements shall be recorded very carefully and accurately and the recorded measurements shall be maintained and preserved carefully as per extant instructions of EIC (Engineer-in-charge).

2. **Measurements:**

a) Mode of measurements for all items of work shall be as per IS 1200 – Method of Measurement for Building and Civil Engineering Work. Measurement for the work done shall be taken jointly with Architect and EIC in the prescribed format (Measurement Book).

b) The measurements for every completed stage of work shall be taken jointly by the Representative of the Contractor and the technical representative / / Site Engineer of the Architect / Consultant at site. Such measurements shall be taken in accordance with the Standard Mode of measurements as detailed in the relevant I.S. Codes. The measurements shall be submitted to the technical representative / Site Engineer of the Architect / Consultant in the prescribed format by the Contractor under his signature for checking.

c) All measurements of work or materials supplied shall be recorded in measurement sheets, serially numbered Measurements of different trades in a bigger project shall preferably be recorded in separate groups of serially numbered measurement sheets.

d) All measurements shall be recorded by the authorized technical representative of the Architect / Consultant, jointly with the authorized representative of the Contractor.

e) All measurements of work or supplies made shall be recorded at the earliest on the spot under the full signature of the recording official with date of recording measurements.

f) All measurements shall be written in ink on the original sheets. Duplicate and triplicate copies shall be copies of the original sheets.

g) When any entry/measurement is cancelled, the reason for doing so shall be recorded in the Measurement sheets under the dated signature and designation of the official cancelling the entry/measurement.

h) No overwriting or erasing of any kind shall be permitted. Mistakes shall be corrected by cancelling the incorrect entry and writing the correct figures just above the cancelled figures.

i) All the corrections in the Measurement sheets shall be carried out and duly authenticated by initialling/signing only by the person recording the measurements.

j) While recording measurements, the Bill Number, Name of Work, Name of Agency, Work order reference, item number, page number of the relevant contract document together with full description (as written in contract document) of the concerned item of work shall be written in the Measurement sheets.

k) While recording abstract of cost, the Bill Number, Name of Work, Name of Agency, Work order reference, item number, page number of the relevant contract document together with short description of each item of work, total quantities (including the quantities brought forward from previous measurement), approved rates, units and the total amount shall be recorded with the dated signature and designation of the recording official.

l) Allowances for shrinkage and interstices shall be made by separate entries. Full measurements shall be first recorded and deductions in the measurements for shrinkage and interstices shall be recorded thereafter.

m) The Contractors' dated signatures shall be obtained for each set of measurements and abstract of cost as a token of their acceptance of the same.

3. <u>Hidden measurements:</u>

All hidden measurements (items of work which cannot be subsequently checked) recorded shall be checked in full and not less than 25% of all other measurements (to be determined based on value) shall be test checked by a Technical person of the Architect / Consultant. Not less than 10% of all other measurements (to be determined based on value) will be further test checked by the senior level technical person of the Architect / Consultant before certifying the bill of the Contractor for payment.

4. <u>Running Account Bills:</u>

a) The minimum value of interim bill/monthly bill/progressive running account (R/A) bill shall not be less than Rs.30 lakhs (Thirty Lakhs) as mentioned in the tender form. The Contractor has to submit the final bill within two months from the date of completion of work

b) The Contractor shall prepare the bill on the basis of the item wise abstract of the total measured quantities as recorded in the Measurement Sheets. The tender items shall be serially reproduced verbatim in the bill. The extra or variation items which have been sanctioned and for which Variation Orders have been issued shall only be included in the bill. Such extra items shall be shown in the bill in a separate sub-head along with references to the Variation Order number and date thereof. The Contractor shall submit the bill in triplicate and the same will be forwarded to the Architect/ consultant for necessary certification.

c) The bill, after due verification and check of arithmetical calculations and after incorporating necessary corrections wherever required, shall be certified by the Architect/Consultant by recording following certificate under their full signature and date. "The quantities, rates and amount verified. The materials supplied and work done confirm to the specifications

in the Tender or Variation Order. Measurements have been recorded in Measurement Sheets bearing page nos. _to_.".

d) Such certificate shall be recorded at the end of the abstract of the bill as well as in the Measurement Sheet containing the abstract.

e) The bill in triplicate after due certification shall be sent to the EIC along with the enclosures as directed by the Architect / EIC.

5. **Final Bill:** Final Bill should be submitted within Two months from the date of Completion of Work, in triplicate to after completion of Work and complying the following:

(i) No Claim Certificate including no claim from the vendors/suppliers and compensation to the labour engaged for the works,

(ii) Deviation Statement vis-à-vis BOQ.

(iii) Certification of the Architect

(iv) Any other document required by BRBNMPL,

(v) Site clearance,

(vi) Undertaking for statutory compliance shall be submitted along with the Final bill.

(vii) Copy of Latest GST-R1.

a) Bill shall be accompanied with detailed measurement sheet & Abstract of Cost. Measurement shall be given in the standard measurement sheet only with abstract for each Bill and final bill in the Soft copy as well as in the hard copy.

b) The value of work done, less recovery, if any will be payable as per progress of work as running account bills subject to satisfactory completion of work as per Joint measurements entered in the Measurement Book (MB) and the same entered in excel sheets to be submitted for certification to BRBNMPL Officer. Deductions will comprise the deductions as stipulated including statutory deduction.

c) All progress payments made / R/A bills paid shall be regarded as payment by way of advance against final payment only, and not as payment for the work completed.

d) The Contractors must finally complete the work strictly in accordance with the specifications and drawings, if required, by reconstructing or rectifying faulty work.

e) All R/A bills / invoices for progress payments as well as for final payments shall be submitted in prescribed computerized forms supported by detailed measurement of items of work as per measurement books.

f) The Contractor shall not be entitled for the payment for the quantities beyond the tendered quantities unless ordered for by specific written instructions from BRBNMPL.

g) The Bidder shall submit the final bill within 2 (two) months from the date of completion of the works. The final bill submitted by the Bidder shall be processed for payment only after receipt of “No claim certificate” and the clearance of site of all rubbish, debris, vats, tanks, materials, temporary structures, Township and machinery and handing over the site in a tidy and clean condition to the BRBNMPL and any other document required by BRBNMPL.

h) All payments to the Bidder shall normally be made by Account Payee Cheques/Electronics clearing facility. All Bank charges in connection with payment by way of Demand Draft on

specific request of the Bidder shall be borne by the Bidder /RTGS on submission of the request by the bidder as per Finance Department requirement.

6. **Other Payment Terms & Conditions:**

a) The Contractor shall not be paid any mobilization advance or any secured advance.

b) Bill should be submitted to EIC with latest copy of GST return.

c) Bill should have PAN, GST number printed over it.

d) Payment will be done as per actual work carried out.

e) No payment shall be released against the extra materials brought to the site.

f) Undertaking for statutory compliance shall be submitted along with the Final bill.

g) Statutory Deduction of taxes including ITDS shall be made at source as per rule and provisions.

h) Suitable deduction as deemed fit will be made for non-compliance in executing works as per schedule. Such amount shall be decided by the BRBNMPL and shall be binding on the Contractor.

i) GST, taxation shall be calculated as per the new rules and will be paid as per actuals. Statutory Deductions as applicable shall be made from the gross bill amount.

j) DD/RTGS/NEFT charges shall be borne by you. For RTGS/NEFT payment you may forward your Bank Mandate and other details along-with your invoice & copy of your latest GST returns for immediate e-payment.

k) Bidder has to furnish the price-break-up including the tax components.

l) Any revision (increase/decrease) in Statutory rates after opening the tender till the original Contract Period will be paid at actuals on producing the documentary evidence.

m) Any increase in statutory duties beyond scheduled delivery is not attributable to BRBNMPL and the same will have to be borne by the Contractor.

7. **Defects Liability Period: ONE (01) year** from the date of completion of the work. Any defects recorded during the Defects Liability Period i.e. ONE **(1) year** from the date of completion of work, shall be rectified / replaced by the Contractor without any extra cost to BRBNMPL. If the Contractor fail to do so, within (02) Two Weeks after information, BRBNMPL reserve the right to rectify the same through another agency & the cost incurred thus shall be recovered from the Contractor.

(02) Two Weeks resolution time for the Contractor for the resolution of the Complaint during the DLP (Defect Liability Period) beyond which the Company (BRBNMPL) will be free to get the problem / defect repaired / rectified engaging third party and the expenditure incurred on rectification of the defect/s may be recovered from the Contractor.

8. **POLICE Verification and Character Complaince:**

   a. Before the start of the work / deployment of personnel, the contractor shall submit the following undertaking in connection with taking responsibility of the character of the deployed personnel:

"It is certified that I know personally the person for whom the entry permission is required and there is nothing adverse report or Police cases against him/her/ them to debar their entry to the work site. I take the responsibility for all those mentioned in the list who acts detrimental to the security and safety of BRBNMPL and other property of the undertaking as also violation of any provision of law & rules framed there under and instruction of Managing Director, CGM, SGM, GM and any Executive of BRBNMPL."

b. In case any worker/supervisor is to be deployed more than 90 days (03 Months), the Contractor shall submit police clearance certificate for good character for the workers/supervisor for complying Security formalities. The cost of verification will be borne by the Contractor.

c. BRBNMPL reserves the right to get the character / antecedents of the employees of the Contractor verified through police. Any worker of the Contractor, if found by the Company as unsuitable or having doubtful integrity, shall be removed from the premises at the risk and cost of the Contractor. The Contractor shall vouch guarantee for the integrity of its workers.

भाग / Section VI – आवश्यकताओं की सूची / List of Requirements

e-Tender Document for "Renovation of Corporate Office Building at BRBNMPL, Bengaluru"

निविदा सं. 008/CO/OT/2023-24 दिनांक February 29, 2024
Tender No: 008/CO/OT/2023-24 dated February 29, 2024

MSTC eTender No:
BRBNMPL/Corporate Office/Technical/2/23-24/ET/64[Renovation works of building]

To be downloaded from website www.mstcecommerce.com

Sl. No.	Brief Description of Goods / Services	Quantity [with unit]	Earnest Money Deposit	Estimated Value (₹)
1.	Renovation of Corporate Office Building at BRBNMPL, Bengaluru **(NON-SPLITABLE)** [As per List of Requirements in Section VI & as per detailed specifications in Section VII, Section VIII, Section IX: Price Schedule]	As per BoQ at Section XI: Price Schedule	₹ **4,90,000/-** (Exempted bidders are required to submit Bid security declaration as per Annexure-7)	₹ **2,45,00,000/- (Rupees Two Crore Forty Five Lakh) only**

2. The work shall be carried out the following address:

   Bharatiya Reserve Bank Note Mudran (P) Limited,
   Corporate Office
   No. 3 & 4, 1st Stage, 1st Phase,
   BTM Layout, Bannerghatta Road,
   Bengaluru – 560029
   GST No. : 29AAACB8111E1Z1

3. **The destination state for GST purposes is 'Karnataka'.**

4. **Pre-Bid Visit: The bidder must visit the site / office site at her / his own cost, responsibility & risk and obtain for himself all the information which may be necessary for the purpose of making a tender and for entering into a contract and must inspect the site of the work and acquaint himself with all scope of work, volume of work, local conditions, means of access to the work, nature of the work and all matters appertaining thereof.**

5. One Architect Firm has been appointed for "Comprehensive Interior Design Consultancy Services for Office Space Re-designing and Renovation work of BRBNMPL, Corporate Office, Bengaluru". Supervision of Renocation Construction Work is entrusted to the Architect. The details of Architect Firm and BRBNMPL's Engineer-in-charge (EIC) shall be shared with the successful bidder at the time of award of Contract.

6. The tender drawings may be made available to participating bidders on submission of request (alongwith evidence of registration on MSTC Ecommerce portal) to the Contact person mentioned at page 2 of the tender. The detailed drawings shall be issued to the successful bidder.

7. Each of the tender documents should be signed by the person or persons submitting the tender in token of his/their acquainted himself/themselves with the General Conditions of Contract, Specifications, Special Conditions, etc. as laid down. Any tender with any of the documents not signed may be rejected.

8. The tender submitted on behalf of a firm shall be signed by all the partners of the firm or by a partner who has the necessary authority on behalf of the firm to enter into the proposed contract. Otherwise the tender may be rejected.

9. Contractor's Responsibility: The contractor shall provide everything necessary for the proper execution of the works according to the intent and meaning of the schedule of quantities and specifications taken together whether the same may or may not be particularly shown or described therein provided that the same can reasonably be inferred there from. If that contractor finds any discrepancy in the schedule of quantities and specifications, he shall immediately and in writing refer the same to BRBNMPL who shall decide which is to be followed.
10. **Since, office is functional in the building; the work shall be planned and executed in such a way to create minimum hindrance to the working of office. Therefore, work should be completed in phased manner floor by floor / stage by stage / as per work fronts availability / priority in consultation with BRBNMPL.**
11. Co – ordinations with Other Agencies: BRBNMPL reserves the right to use premises and any portions of the site for the execution of any work not included in this contract which it may desire to have carried out by other persons, and the contractor shall allow all reasonable facilities for the execution of such work but shall not be required to provide any plant or material for the execution of such work except by special arrangement with BRBNMPL.
12. Non – Compliance Of Site Instruction: If the contractor after receipt of written notice from BRBNMPL requiring compliance within 7 days fails to comply with such instructions, BRBNMPL may employ and pay other contractor to execute any such work whatever that may be necessary to give effect thereto, and all cost incurred in connection therewith shall be recoverable from the contractor by BRBNMPL as a debt or may be deducted from any payment due to the contractor.
13. Alteration in quantity or work, specification, addition of work / deletion of work: BRBNMPL shall have power to make any alterations / additions to or substitutions for the original specifications and instructions that may appear to him to be necessary during the maintenance work. For that purpose or if for any other reason it shall in its opinion be desirable, it shall have power to order the contractor to do any or all of the following:
    a. Increase or decrease the quantity of any work included in the contract.
    b. Delete any such work.
    c. Change the character or quantity or kind of any such work.
    d. Change the names, levels, liners, positions and dimensions of any part of the work.
    e. Execute additional work of any kind necessary for the completion of the work
    f. Change in any specified sequence, method of timing of the work.
    g. The contractor shall be bound to carry out the work in accordance with any instructions in these connections which may be given to him in writing signed by the BRBNMPL and shall not on any way vitiate or invalidate the contract.
    h. Quoted rates shall be firm and binding and inclusive of all taxes & charges.
    i. Statutory deduction of taxes shall be made at the source.
    j. Successful Bidder has to arrange all the required materials, labors, transportation etc., at his own cost.
    k. The Successful Bidder has to strictly follow the safety norms during his work & also take care for BRBNMPL property.
    l. The Successful Bidder should understand the scope of work before quoting and inspect the site accordingly.

Bidders may note the following parameters and satisfy themselves that they fulfil all the criteria before bidding: -

Sl. No.	Parameter	Accepted by Bidder	Remarks
1	Quantity with UoM * The schedule of items & quantities to be executed is indicative only. Any / all item(s) may/ may not be operated & actual quantity may vary from BOQ at Section XI: Price Schedule. Contractor shall not have any claim for the same.	Accepted	

We have accepted the above parameters and are satisfied that we fulfil all the criteria for bidding in the tender. We shall comply with, abide by, and accept without variation, deviation, or reservation all requirements detailed in Section VI: List of Requirements.

Signature of Authorized Signatory with Date and Seal

CHAPTER – A: CIVIL WORKS

1. EARTH WORKS

1.1 The excavated earth shall be put to use in the areas related to the work and thereafter the extra earth shall be used in filling up the low-lying areas of the total plot, at his own cost. If there is any surplus excavated earth thereafter, the same shall be disposed off by the contractor at his own cost to the place approved by BRBNMPL/CONSULTANT after obtaining written permission of BRBNMPL/CONSULTANT and no payment will be made for disposal of this excavated earth.

1.2 The Contractor shall, at his own expense and without extra charges, make provision for all shoring, pumping, dredging or bailing out water, encountered from any sources such as rains, floods, springs, subsoil water table being high or due to any other cause whatsoever. Filling in plinth shall be in layers and consolidated with water and compacted, to achieve 90% relative density on testing. One test is to be carried out for 1000 sqm. of compacted area.

1.3 Anti-termite treatment: Anti-termite treatment shall be got done through approved specialized agencies only. During the execution of work, if any damage shall occur to the treatment already done, either due to rain or any other circumstances, the same shall be rectified and made good to the entire satisfaction of the BRBNMPL/CONSULTANT by the contractor at his costs and risks.

1.4 Clearing: The contractor shall clear the site of all rubbish, remove all grass and low vegetation and remove all bush wood, trees, stumps of trees, and other vegetation only after consultation with BRBNMPL/CONSULTANT as to which bushes and trees shall be saved. All disused foundations, drains or other obstructions met with during excavation shall be dug out and cleared.

1.5 Site Levels: The contractor shall carry out the survey of the site and shall establish sufficient number of grids and level marks to the satisfaction of BRBNMPL/CONSULTANT, who shall decide on the basis of this information, the general level of the plot and the yard /plinth level.

1.6 Bench-marks: Prior to commencement of construction, the contractor shall in consultation with BRBNMPL/CONSULTANT, establish several site datum bench-marks, their number depending on the extent of the site. The bench-marks shall be sited and constructed so as to be undisturbed throughout the period of construction.

1.7 Site investigation: The contractor shall inspect the site and study the findings from the trial pits or bores in order to assess the problems involved in and methods to be adopted for excavation and earthwork. The contractor shall ascertain for himself all information concerning the sub-soil conditions, Ground water table, periods and intensity of rainfall, flooding of the site and all data concerning excavation and earthwork. Any additional work incurred during execution due to insufficient investigations will not be paid extra.

1.8 Setting out the work: The contractor shall do proper setting out for the building, any additional work executed due to improper setting out shall be borne by the contractor. The contractor shall ensure compliance with all documents throughout the execution time. The contractor shall be responsible for all the errors in this connection and shall have to rectify all defects and/or errors at his own cost, failing which BRBNMPL/CONSULTANT reserves the right to get the same rectified at the risk and cost of the contractor.

1.9 Cleaning up and handing over: Upon completion of the work all the areas should be cleaned. All floors, doors, windows, surface, etc. shall be cleaned down in a manner which will render the work acceptable to BRBNMPL/CONSULTANT. All rubbish due to any reason, shall be removed daily from the site and

an area of up to ten metres on the outer boundaries of the premises will be cleaned by the contractor as a part of the contract. Upon completion of the project, the contractor shall hand over to BRBNMPL/CONSULTANT the following:

- Written guarantee and certificates.
- Maintenance manuals, if any, and
- Keys.
- Samples

1.10 The contractor shall submit to BRBNMPL/CONSULTANT samples of all materials for approval. Samples of masonry units, building insulation, finished hardware, metal window and door frames, terrazzo flooring, marble etc. and every other work requiring samples in the opinion of BRBNMPL/CONSULTANT shall be supplied, and these samples will be retained as standards of materials and workmanship. The cost of the samples shall be borne by the contractor.

Throughout this specification, types of material may be specified by manufacturers' name in order to establish standard of quality, price and performance and not for the purpose of limiting competition. Unless specifically stated otherwise, the tenderers may assume the price of 'approved equivalent' except that the burden is upon the contractor to prove such equality.

1.11 A detailed programme shall be submitted by the Contractor for the material approvals, within four weeks of order to commence. The detailed programme shall include but not limited to:

- Date/s of submitting the various material samples.
- Date/s by which BRBNMPL/CONSULTANT approval is required.
- Date/s of placing orders on the Manufacturers/Suppliers.
- Date/s of arrival of the approved material/s on to the site.
- Date/s of the completion of the `Mock-ups', wherever required, and the Date/s by which the inspection of such `Mock-ups' should be completed and the Date/s by which should fully approve the said Mock-ups.

1.12 All materials and methods of tests shall conform to the latest rules, regulation and/or specifications of the following authorities where specified herein as applicable. Bureau of Indian Standards (BIS), National Building Code (NBC) in case no equivalent BIS is available. BRBNMPL or his representative will have the option to have any of the materials tested and if the test results show that the materials do not conform to the specifications, such materials shall be rejected. A reasonable number of representative tests will be deemed to be included in the rates tendered.

2. SITE DEVELOPMENT AND EARTH WORK

2.1 General: The Contractor, at his own cost, shall visit the site, inspect the same and decide for himself the nature of the ground and the sub-soil to be excavated. No claim on account of extras will be entertained in consequences of any misunderstanding or incorrect information or ignorance of the existing conditions. The following specification but not limited to, shall be followed for site development and earth works.

2.2 Classification of Soils: The earth shall be classified under the following categories

2.2.1 Hard dense soil: Generally, any soil which requires the close application of picks or jumpers or scarifiers and rippers to loosen the same such as

- Stiff clay, hard shale or compact moorum requiring grafting tool and/or pick and shovel.
- Shingle and river or nallah bed boulders.
- Lime concrete, stone masonry in lime or cement mortar below ground level.

- Soft, conglomerate or soft laterite when the stone can be detached from the material with picks and shovel.
- Existing WBM roads, pavements etc.

2.2.2 Ordinary/Soft/Decomposed rock (not requiring blasting): Rock or boulders, which may be quarried or split with crowbars or wedges/picks; such as lime stone, sand stone, hard laterite, hard conglomerate or other soft or disintegrated rock.

2.2.3 Hard rock (requiring blasting): Rock which is in solid beds, which can only be removed either by wedging or chiseling, shall be treated as hard rock. An isolated boulder or detached rock, measuring one cubic meter or more, shall also be treated as hard rock, if the same cannot be removed without wedging or chiseling. (If required, approved chemical may be used for loosening the materials).

2.3 Blasting is totally prohibited and will not be allowed under any circumstances.

2.4 Authority for classification of Soils/Rocks: The classification of excavation shall be decided by the BRBNMPL/CONSULTANT and his decision shall be final and binding on the contractor.

2.5 Blasting: Blasting shall not be permitted under any circumstances. The Contractor, at his own cost can use alternate chemicals to split rock.

2.6 Trimming of Slopes: All slopes shall be trimmed by hand or mechanically true to line and profile and consolidated. Any rock or boulders appearing on the face or likely to be unstable, shall be removed and the void thereof filled with approved material and compacted. No extra amount shall be claimed by the contractor on this account and his quoted rates shall be deemed to have been included for trimming of slopes.

2.7 Shoring/Earth work support: The contractor shall shore and strut the sides of excavation. Should there be any slips or settlement, notwithstanding the shoring, the contractor shall make good the same at his own expense, with concrete or other approved material. Shoring shall be removed gradually side by side with backfilling to prevent any settlement and under no circumstances, until such time as the foundation concrete has hardened enough, to take any loads brought on by the removal. No extra payment shall be made for shoring. The rate for the same shall be included in the excavation items.

2.8 Dewatering: All excavation shall be kept free from water from any source. The contractor shall provide and clear away on completion, all drains, pumps and other equipment, for this purpose. The contractor shall be responsible for preventing any subsidence of adjoining ground due to pumping. Contractor shall keep site dewatered till all construction works in basement and all other areas are completed, including waterproofing. No extra amount shall be claimed by the contractor on this account and his quoted rates shall be deemed to have been included for total dewatering.

2.9 Contractor to keep excavation clear: Should any sand, mud, weed, rubbish or other materials be deposited on excavated area, by sandstorm, rain, flood, landslips or from any cause, whatsoever, such materials shall be removed by the contractor at his own expense.

2.10 Back filling: All materials used as fill shall be and shall be well consolidated in layers not more than 200 mm thick. Final compacting must be done just before concrete is to be laid. All fill materials shall be compacted at a moisture content appropriate to the material being used. The compacted filling shall achieve a density, which shall not be less than 90% of the maximum dry density obtained. Filling shall be free of any wood, organic matter or any other deleterious material.

2.11 Sand, soil, gravel etc. from the excavation may be used for backfilling of pits and trenches or for making up levels subject to selection of proper materials. In case the excavated materials are not approved for backfilling, either totally or in part or if their quantity falls short of the quantity required

for filling, suitable materials shall be brought to site from an approved source. No extra amount shall be claimed by the contractor on this account and his quoted rates shall be deemed to have been included for total backfilling.

2.12 Disposal of surplus: Surplus excavated materials and all excavated materials rejected for backfilling, shall be carted away from the site by the Contractor at his own cost. Wherever rock excavation is encountered, contractor shall remove the same without any extra cost. The Contractor shall visit the site and assess the site condition before quoting for the work.

2.13 Excavation in all Soils: Excavation and/or removal of any other material on the site shall be carried out accurately to the lines, levels and dimensions shown in the drawings, so as to allow proper and efficient concrete work and other work in clean and dry condition. All founding levels will be inspected and suitability for bearing of the bottom shall be determined before the concrete is placed. Records of all foundation levels shall be submitted by the contractor. The excavation bottom shall be watered before the foundations are laid.

2.14 Pre-construction Anti-termite treatment: Anti-termite treatment shall be got done through approved specialized agencies only. During the execution of work, if any damage shall occur to the treatment already done, either due to rain or any other circumstances, the same shall be rectified and made good.

2.15 Chemicals: The chemicals used for the soil treatment shall be any one or a combination of the following with concentration shown against each in adequous emulsion:

- Chemicals (EC's) Concentration
- Chlorpyriphos / Landane 20% EC By weight

2.16 Chemical shall be brought to site of work in sealed original containers. Chemical to be applied as per manufacturer specification and as per approved method of statement. Proper check should be kept that the specified quantity of chemical is used for the required area during the operation.

2.17 Time of application: Soil treatment should start when foundation trenches and pits are ready to take mass concrete in foundations. Treatment should not be carried out when it is raining or soil is wet with rain or sub-soil water. The foregoing applies also in the case of treatment to the filled earth surface with the plinth before laying the sub grade for the floor.

2.18 Safety precautions: All chemicals used for anti-termite treatment are poisonous and hazardous to health. These chemicals can have an adverse effect upon health when absorbed through the skin, in haled as vapours or spray mists or swallowed. Person using or handling these chemicals should be warned of these dangers and advised accordingly.

3. PLAIN AND REINFORCEMENT CEMENT CONCRETE WORKS

3.1 General: All concrete included in the works shall comply with the General requirements of this section of the specification except where those requirements are modified by the provisions of later Clauses relating to specialized uses for concrete in which case the requirements of those Clauses shall take precedence. All designs and execution shall be according to the latest version of relevant IS codes, CPWD and other relevant manuals mentioned elsewhere in this document. The following specification but not limited to, shall be followed for concrete and steel works.

3.2 CONCRETE WORKS (PLAIN AND RCC)

- Generally, all concrete work shall be as per IS-456 (latest edition) characteristic strength (28 days) shall be 20 N/sq. mm, 25 N/Sq mm, 30 N/Sq mm and 35N/sqmm as may be specified on drawings. The use of concrete admixtures shall be approved by BRBNMPL/CONSULTANT. The items include for providing all materials, mixing, placing, compacting, cutting, finishing, placing inserts, holding

down bolts and flanges, sleeves, puddle flanges, embedding all services pipes, boxes, hooks etc. as shown in drawings at correct location level with required changes in form work, reinforcement etc., complete. All RCC works and all concrete shall be machine vibrated. Formwork and reinforcement are measured separately.

- All concrete shall be with 20mm and downgraded nominal size stone aggregates except specified otherwise. Curing of the concrete shall be as per IS-456 (Latest Edition).

- The rate of reinforcement work shall include for handling/ storing clearing of rust, straightening, bending and placing, binding, fixing in proper position at any height/level with 18 gauge annealed binding wires, necessary chairs, spacer bars, wastage and cement mortar cover blocks at proper positions to maintain proper cover as per IS-456 (Latest Edition). Reinforcement shall be provided in accordance with latest versions of IS-2502, IS 13920, SP 34 and any other relevant codes for detailing.

- Holes and openings in RCC slab/walls, parapet, masonry works, pockets in machine foundation, beam, parapets, for rainwater pipe or spouts and plumbing pipes shall be left at the time of concrete casting or raising masonry and making good after fixing fixtures.

- Reinforcement shall be by weight actually placed in position as per the bar bending schedule, to be prepared by the contractor. The weight shall be taken as per IS Code for the particular diameter. Rates quoted for reinforcement shall include for cutting, bending, binding the reinforcement bars in any shape, hoisting to all leads and lifts and placing in any position as per detailed drawings, including providing precast cement concrete cover blocks of required thickness for keeping bars in position. 18 gauge annealed binding wire for tying for reinforcement shall be provided by the contractor. The contractor should cover for this in his overall rate for the reinforcement rates including removing rust, Mill scales, oil, grease, paint etc. from reinforcing bars.

- Centring, shuttering, boxing propping including special nuts, bolts etc. in perfect line, level, plumb and if required to provide camber, slope and removal thereof. Colorless shuttering oil or grease of approved quality shall be applied to forms before placing steel. Rate to include for any shapes including offsets/ chamfering in columns, residues, grooves, drip moulds, irregular shapes etc. Stripping time for the formwork, centering and dropping shall be as per IS-456 (Latest Edition).

- Work at all heights, depths & levels irrespective of individual storey.

- Work in narrow widths, Piece meal/ small work, screeding under floor etc.

- All staging upto any height and scaffolding work shall comprise of MS Pipes/ Structural steel sections with necessary coupling arrangement. (NO WOODEN BALLIES / PROPS WILL BE PERMITTED). Adequate size foundation blocks / base plates shall be provide below staging members to disperse the loads as per the founding strata.

- Contractor to consider in his quoted rates the necessary arrangement e.g. providing and fixing of required quantity of woven mesh at the junction of Beam and Column or any other RCC members to separate two different grade of concrete mixes. No payment shall be made for over flowed richer mix of one RCC member into the other.

- Use of greater than minimum specified quantities of cement to achieve specified or required mix design. RCC (M30) for all water retaining structures with minimum cement content of as per IS 3370,(Latest Edition). Use of plasticiser / super plasticiser and / or additional cement for pumpable concrete. Non-destructive test for defective concrete as directed by BRBNMPL/CONSULTANT, and their remedial measures thereof if required. Providing dowels for anchorage and joining RCC members if required.

- Mix designing and testing of all the ingredients of concrete from reputed institutes approved by BRBNMPL/CONSULTANT for each grade, pumpable & non-pumpable concrete. Compliance with all requirements of technical specification.

3.3 Quality Assurance Plans and Supervision: A competent person shall be employed full time whose first duty will be to supervise all stages in the preparation and placing of the concrete. All test on materials, the making and testing of cubes and the maintenance and calibration of all mixing and measuring plant shall be carried out under his direct supervision in the presence of BRBNMPL/CONSULTANT. Contractor shall set up a laboratory with all testing arrangement at site. On award of the work contractor shall submit their quality assurance plans, complete methodology & sequence of construction for all activities to BRBNMPL/CONSULTANT.

3.4 Materials

3.4.1 Cement: Cement shall in general comply the following specifications:

- Types: The cement used shall be ordinary Portland cement conforming to IS 8112 – 1989(Latest revision) of grade 43/ IS 12269 - 2013 (Latest revision). PPC confirming to 1489 (Part I) - 1991 (Latest revision) can also be allowed without fly ash.

- All cement shall be fresh when delivered. Cement shall be delivered in sound and properly secured bags or other packages ready for immediate use and shall be used direct from the bag. The contractor shall maintain for inspection a record of receipts and consumption of cement indicating the source, the age and the date of receipt of cement. Cement containing lumps which cannot be broken by a light touch of fingers shall not be used in the works. Admixtures shall not be used without written consent of the BRBNMPL/CONSULTANT.

- Sources: The contractor shall use the cement as required in the work, from manufacturers as per list of approved makes or from any other reputed cement manufacturer. Makes and sources of cement shall not be varied from those used for trial mixes; should a change be unavoidable the contractor shall submit his proposals for the prior approval of BRBNMPL/CONSULTANT and then carry out new trial mixes unless otherwise directed. Cement of different kinds shall not be mixed at any stage.

- Manufacturers' Test Certificates for Cement: The Contractor shall request the cement manufacturer to forward to his site office the Certificate of conformity in accordance with IS (Latest Revision), and he shall cause a copy to be supplied within 48 hours of the arrival of the certificate, which shall not be later than 14 days from the day of delivery of the relevant consignment. The test certificate shall be related to the date of delivery at site of consignment. The frequency of deliveries shall be such as to ensure that no cement is more than 3 months old when used in the works.

- Samples of Cement: Samples of cement to be used in the works shall be deposited with BRBNMPL/CONSULTANT for his approval together with a certificate stating the name and address of the Manufacturer, the name and address of the supplier from whom it was purchased. The Contractor shall supply free of charge the cement required for testing including its transportation cost to testing laboratories. The cost of tests shall be borne by the Contractor

- Storage of Cement: The contractor shall provide a proper separate weatherproof store building with raised floor for cement storage on the site and shall at all times protect the cement from damp or any other deleterious influences. Each consignment of cement shall be kept separately and the contractor shall be careful to ensure the consignments are used in the order in which they are received.

- In case cement gets affected from damp or any other deleterious influence, such cement shall not be used for construction work. The damaged cement shall be removed from the site immediately by the Contractor. If he does not do so within 3 days of receipt of such notice, the BRBNMPL/CONSULTANT shall get it removed at the cost of the Contractor.

3.4.2 Aggregates

- Materials used as aggregates shall be obtained from a source known to produce aggregates satisfactory for concrete and shall be chemically inert, strong, hard, durable, of limited porosity and free from adherings, coating, clay lumps, coal residues and organic or other impurities that may cause corrosion of reinforcement or may impair the strength or durability of the concrete. Aggregates shall be tested in accordance with the requirements of IS. 383 or IS. 515 and the results of such tests shall be as hereinafter specified, the percentages being by weight unless the context indicates otherwise.

- Fine aggregates shall be natural sand or sand derived by crushing material like gravel or stone and shall be free from coagulated lumps. Sand derived from stone unsuitable for coarse aggregates shall not be used as fine aggregates. The caustic soda test for organic impurities shall show a colour not deeper than that of the Standard solution. The amount of fine particles as ascertained by the Laboratory Sedimentation test shall not exceed 10% for crushed stones. The settling test for natural sand or crushed stone shall be made, and after being allowed to set in for three hours the thickness of the layer of silt deposited on the coarser material shall not exceed 8%.

- The grading of a natural sand or crushed stone i.e. fine aggregates shall be such that not more than 5 (five) percent shall exceed 5 mm in size, not more than 10% shall pass IS sieve No. 150 not less than 45% or more than 85% shall pass IS sieve No. 1.18 mm and not less than 25% or more than 60% shall pass IS Sieve No. 600 micron.

- Only washed sand of quality and grading specified herein above shall be used. Admixture of sand obtained by crushing natural stone may be permitted, provided the mixture satisfies the requirements for the fine aggregates here in above specified. But not more than one part of the sand obtained by crushing natural stone may be added to two parts of washed sand.

- Coarse Aggregate: Coarse Aggregates shall be crushed stone. The pieces shall be angular, rounded in shape and shall have granular or crystalline or smooth (but not glossy) non-powdery surface. Fragile, flaky and laminated pieces, and mica shall not be present.

3.4.3 Steel Reinforcement

- The Contractor shall procure reinforcement steel from primary steel producers from the list of Approved make for Civil Works provided in the agreement.

- The manufacturer has to give a certificate that the material supplied is not a re-rolled product. Relevant vouchers & test certificates will be produced by the contractor.

- The Contractor shall have to obtain and furnish manufacturer Test Report /test certificates for each lot. Tests reports to BRBNMPL or his representative in respect of all supplies of steel brought by him to the site of work. Re-rolled sections will not be allowed.

- Reinforcement steel, structural steel shall be stored and stacked in such manner so as to facilitate easy identification, removal etc.

- The contractor shall take proper care to prevent direct contact between the steel and the ground/

water for which he shall provide necessary arrangement at his own cost including ensuring proper drainage of area to prevent water logging.

- Steel shall also be protected, by applying a coat of neat cement slurry over the bars for which no extra payment shall be made.

- Test certificates for each consignment of steel shall be furnished and further tests shall be got carried out from the authorized laboratory, before incorporating the materials in the work.

- Nothing extra will be paid for "straightening of bars" received from market in coils or with bends. All incidental charges of any kind whatsoever including cartage, storage, safe custody of materials, cutting and wastage etc. shall be borne by the contractor.

- The reinforcement steel shall in general comply the following specifications:

  - Type : Steel for bar and fabric reinforcement shall conform to mild steel of tested quality conforming to IS. 432 (Latest), or high yield strength deformed bar conforming to IS. 1786 or as specified in the drawings. The steel shall be kept clean and free from pitting, loose rust, mill scale, oil, grease, earth, paint or any material which may impair the bond between the concrete and the reinforcement or which may cause corrosion of the reinforcement or deterioration of the concrete. Fabric reinforcement (IRC weld mesh or equivalent) shall be delivered to site in flat sheets only.

  - Storage of Reinforcement: Before and after bending, reinforcement shall be stored on raised racks in separate lots by size and type and protected from damage, contamination and the effects of the weather. For the purposes of identification each lot shall be marked plainly and securely by approved methods.

  - Fabrication: Fabrication shall be accurately done to the dimensions, spacing and minimum cover as per structural drawings. Spacers shall be of cement mortar (1:2) cubes however shall not be leaner than the approved design mix. Steel chairs, spacer bars shall be used in order to ensure accurate positioning of reinforcement. All joints in steel reinforcement shall be overlapped.

  - Welded Laps: Wherever specified, welded laps shall be provided and paid for separately unless specifically included in the item of work. No payment shall be made to the contractor for welding, if the same is necessitated due to the reasons attributable to the Contractor.

- The welding of bars shall be carried out as per IS: 2751-1979, IS:9417-1979.

- The Contractor shall supply free of cost the required steel bars for testing as per the requirement. The cost of tests shall be borne by the Contractor. In case the test results indicate that the steel arranged by the Contractor does not conform to the specifications as defined the same shall stand rejected, and it shall be removed from the site of work by the Contractor at his cost within a week time or written orders to do so. For checking nominal mass, tensile strength, bend test & re-bend test etc. specimen of sufficient length shall be cut from each size of the bar at random at frequency not less than the specified below:

Size of bar	For consignment below 100 tones	For consignment above 100 tonnes
Under 10 mm dia bars	One sample for each 25 tonnes or part thereof	One sample for each 40 tonnes part thereof

10 mm to 16mm dia bars	One sample for each 35 tonnes or part thereof	One sample for each 45 tonnes part thereof
Over 16mm dia bars	One sample for each 45 tonnes or part thereof	One sample for each 50 tonnes part thereof

- The actual issue and consumption of steel on work shall be regulated and proper accounts shall be maintained. The theoretical consumption of steel shall be worked out as per procedure prescribed and shall be governed by conditions laid therein.

- Steel brought to site and remaining unused shall not be removed from site without the written permission of BRBNMPL/CONSULTANT.

3.5 Bar Bending Schedule: Contractor shall prepare bar bending schedules and shall get them approved from BRBNMPL/CONSULTANT.

3.6 Records of Consumption of Cement & Steel: For the purpose of keeping a record of cement and steel received at site and consumed in works, the contractor shall maintain a properly bound register in the form approved by BRBNMPL/CONSULTANT, showing columns like quantity received and used in work and balance in hand etc. The contractor 's representative shall sign this register daily.

3.7 The register of cement & steel shall be kept at site in the safe custody of BRBNMPL/CONSULTANT during progress of the work. This provision will not, however, absolve the contractor from the quality of the final product.

3.8 Water Type: Water for mixing concrete shall be clean and free from harmful material and comply with the requirements of Clause 5.4 of IS:456: latest. Water shall be only from sources / bore wells approved.

3.9 Grades and Strength Requirements of Concrete General: Concrete shall consist of the material described under previous sections, using separate coarse and fine aggregate in an appropriate combination determined in the course of the preparation of mix design described hereinafter. The overall grading shall be such as to produce a concrete of the specified quality, which will work readily in to position without segregation and without the use of excessive water. It shall be a homogeneous mix before use at site

3.10 Slump: Only specified quantity of water shall be added to the cement and aggregate during mixing to produce concrete having a sufficient workability to enable it to be well consolidated, to be worked in to the corners of the shuttering and around the reinforcement to give the specified surface finish, and to have the specified strength. Water cement ratio shall be maintained as per IS. 456-(latest) unless specified otherwise. When a suitable amount of water has been determined, the resulting consistency shall be maintained throughout the corresponding parts of the work and tests shall be conducted to ensure the maintenance of this consistency according to the standard method of test for consistencies of concrete (slump test) as below:

Description of work	Maximum slump in mm.
Beams and slabs	25 to 75mm
Columns & Walls	50 to 100 mm
Slabs & Staircase	upto 25 mm
Footings	upto 25mm

3.11 In case of pumpable concrete, the slump & workability required for pumping the concrete shall be achieved by the contractor at his own cost. Nothing extra shall be paid for use of extra cement and / or

plasticizers.

3.12 Concrete Grades: Grade of concrete used in the works shall be shown on the drawings. Minimum cement contents shall be as per Is 456- (latest) or specified otherwise. The grade of concrete to be adopted in the construction shall be as follows: -

- For mud mat, lean concrete, mass filling the concrete mix will be nominal mix concrete of 1:5:10 , 1:4:8 , 1: 3:6 (Cement : Coarse sand : 20mm Down aggregates) grade as specified in the construction drawings These mixes may be prepared using mechanical mixer.

- For all RC.C work concrete used will be controlled concrete with grade of concrete M20 or more as per construction drawings. The cementitious contents in the mix design shall not be lesser than as indicated in the table below. The water cement ratio and other parameters shall be strictly adhered to as per the table below:

Grade	Min. cement	Water Cement	Compressive Strength	
	Kg/Sq.cm	Kg/Cum.(*) ratio	7 days filed test	28 days filed test
M - 20	320	0.55	135	200
M - 25	350	0.50	170	250
M - 30	400	0.45	200	300
M - 35	450	0.45	235	350
M - 40	480	0.40	270	400
M - 45	480	0.40	300	450

- *Note:- the actual requirements of cement contents are likely to be more than the minimum indicated. The limit has been fixed strictly from the concrete's durability point of view.

- Approved admixtures may be used strictly as per IS 456-(latest) and nothing extra will be paid for the use of the same. Admixture used should not impair durability of concrete nor combine with constituents to form harmful compounds nor increase the risk of corrosion of reinforcement. Dosages of retarders, plasticisers and super plasticisers if used shall not exceed 0.5, 1.0 and 2.0 percent respectively by weight of cementitious materials.

3.13 MIX DESIGN: The RCC work shall be done with RMC of Design Mix Concrete, unless otherwise specified. The contractor shall carry out design mixes for each class of concrete indicating that the concrete ingredients and proportions will result in concrete mix meeting requirements specified.

3.14 As the guarantor of quality of concrete used in the construction, contractor shall carryout mix design and the mix so designed shall be approved BRBNMPL/CONSULTANT, however approval BRBNMPL/CONSULTANT shall not relive the contractor from his responsibility towards quality & sufficiency of design mixes. The mix shall be designed to produce the grade of concrete having workability and a characteristic strength as indicated in the drawings. The target mean strength of concrete mix should be equal to the characteristic strength plus 1.65 times the standard deviation as indicted below.

GRADE OF CONCRETE	STANDARD DEVIATION (N/Sq mm)
M10, M15	3.5
M20, M25	4.0
M30 to M50	5.0

3.15 Mix design shall be carried out as per SP-23 (Hand book concrete mixes) Proportion / Type of aggregates shall be made by trial in such a way so as to obtain dense possible concrete with required workability. All ingredients of concrete should be used by mass only. Contractor shall carry out the mix design and get it tested from the laboratory / Institution as per the instructions of BRBNMPL/CONSULTANT

3.16 No substitutions in materials used on the work or alterations in the established proportions be made without additional test to show that the quality and strength of concrete are satisfactory.

3.17 Design mix shall not be converted into volume mix under any circumstances.

3.18 BRBNMPL/CONSULTANT will reserve the right to inspect at any stage and reject the concrete if he is not satisfied about quality of product at the user‘s end.

3.19 BRBNMPL/CONSULTANT reserves the right to exercise control over the: -

- Ingredients, water and admixtures purchased, stored and to be used in the concrete including conducting of tests for checking quality of materials, recording of test results and declaring the materials fit or unfit for use in production of mix.

- Calibration check of the plant

- Weight and quantity check on the ingredients, water and admixtures added for batch mixing.

- Time of mixing of concrete.

- Testing of fresh concrete, recordings of results and declaring the mix fit or unfit for use. This will include continuous control on the workability during production and taking corrective action, if required.

- For exercising such control, BRBNMPL or his representative shall periodically depute his authorized representative at the RMC plant. It shall be responsibility of the Contractor to ensure that all necessary equipment, manpower & facilities are made available to his authorized representative at RMC plant.

3.20 Ready Mix Concrete (RMC):The contractor shall engage Ready Mix Concrete (RMC) producing plants to supply RMC for the work. The RMC plant proposed to be engaged by the contractor shall fulfill the following requirements.

- It shall be fully computerized.

- It should have supplied RMC for Govt. projects.

- It should have facility for providing printed advice showing ingredients of concrete carried by each mixer.

3.21 The Ready-Mix Concrete (RMC) producing plants of the main Cement producers shall be preferred.

3.22 BRBNMPL/CONSULTANT reserves the right to exercise check over the:-

- Ingredients, water and admixtures purchased, stored and to be used in the concrete including conducting of tests for checking quality of materials recordings of test results and declaring the material fit or unfit for use in production of mix.

- Calibration check of the RMC.

- Weight and quality check on the ingredient, water and admixture added for batch mixing.

- Time of mixing of concrete.

- Testing of fresh concrete, recordings of results and declaring the mix fit or unfit for use. This will include continuous control on the workability during production and taking corrective action.

3.23 Computer Print outs of Each Truck Load: Each truckload / transit mixer dispatched to site shall carry computer printout of the ingredients of the concrete it is carrying. The printout shall be produced to BRBNMPL/CONSULTANT at site before RMC issued in work.

3.24 Batching and Mixing: Only controlled design mix will be used for concrete with strength more or equal to M20. Volume batching may be allowed (Using mechanical Mixers) for mixes up to M10, for these leaner mixes mass volume relationship shall be checked frequently to ensure specified grading is maintained.

3.25 Concrete Admixtures & Plastisizers: Admixtures are materials added to the concrete before or during mixing with a view to modify one or more properties of concrete in plastic or hardened state. Concrete admixtures are proprietary items of manufacturers and shall be obtained from established manufacturers having proven track record.

3.26 Water proofing compound to be added to the concrete of buried, water retained structures, retaining wall etc as directed.

3.27 Transporting Concrete: From batching plant concrete to the location of proposed construction shall be transported through transit mixers or concrete pumps only. Contractor shall specify the make & type and number of transit mixers to be deployed along with concrete pumps with their make, capacity. From the transit mixers concrete shall be transported to the final floor level / position through pumping only .Concrete and mortar shall be transported speedily and deposited in its place in the works without contamination, loss of ingredients or segregation.

3.28 Concrete placement

- General: Concrete, when deposited, shall have a temperature of not less than 5oC (41oF) and not more than 32oC (90oF).

- The concrete shall be placed in the positions and sequences indicated on the drawings, in this specification and/or as directed by BRBNMPL/CONSULTANT.

- Contractor shall give adequate notice to BRBNMPL/CONSULTANT of his intention to concrete any section of the works.

- Except where otherwise directed, concrete shall not be placed unless the BRBNMPL/CONSULTANT is present and has previously examined and approved the positioning, fixing and condition of the reinforcement or any other items to be embedded and the cleanliness, positioning and suitability of the concreting surface.

- The concrete shall be deposited as nearly as possible in its final position. It shall be placed in such a manner as to avoid segregation of the concrete and displacement of the reinforcement, other embedded items, or formwork. It shall be brought up in horizontal layers not exceeding 450 mm in compacted thickness unless otherwise authorized or directed. Concrete shall not be placed

simultaneously on each side of large horizontal specified or approved construction joints.

- Shutters for walls or thin sections of considerable height shall be provided with openings or other devices that will facilitate the cleaning of the accumulation of hardened concrete on the shutters or on the metal reinforcement above the level of the concrete and the removal of concrete in the case of segregations.

3.29 Placing of concrete in wet weather: Concrete shall not be mixed and or placed in rainy weather or when there is likelihood of impending heavy showers. If it becomes necessary to place concrete during rainy weather, the contractor shall provide adequate protection by means of tarpaulin or similar other water proof material to immediately cover fresh concrete to prevent rain falling over it. This protection shall be left on the concrete for a period of 24 hours after placing of concrete.

3.30 Maintenance of Plant and Equipment: The contractor shall keep mixing machines, compressors, vibrators and other plant and equipment for concrete and mortar work clean, well maintained and adjusted and where appropriate, shall check the accuracy of the measuring devices at regular intervals.

3.31 Night Work: Concrete shall not be mixed, placed, compacted or finished during the hours of darkness, except where necessary to complete a pour. However, concreting in darkness for these exceptions shall be only after obtaining the express permission in writing from the BRBNMPL/CONSULTANT and in his presence only.

3.32 Compacting Concrete: The concrete shall be fully compacted through out the full extent of the layer. It shall be thoroughly worked against the moulds, and around any reinforcement and other embedded items without displacing them, and in to corners of the moulds. Successive layers of the same lift shall be thoroughly worked together adjacent to the common face. The date of laying concrete shall be marked for curing and removal of form work.

3.33 Immersion vibrators shall be of approved type and shall have frequency of not less than 10000 oscillations per minute. They shall penetrate the full depth of the concrete to be vibrated and be immersed at sufficiency close spacing so that the whole volume of the concrete is satisfactorily and uniformly compacted. The contractor shall ensure that sufficient standby vibrators and ancillary equipment are available during concreting operations

3.34 Quality Control

- In order to ensure that the quality of materials and the mix proportions are suitable for the particular grade of concrete required are so maintained, sampling and testing shall be carried out regularly during the course or the works.

- As frequently may require and in any case at least once a day while concreting is in progress, the contractor shall sample and carry out a determination of the moisture content and a mechanical analysis of the fine aggregate and each nominal size of coarse aggregate shall lie within the respective limits specified.

- Workability testing shall be carried out in accordance with IS:456. The results shall lie within the range upon which the accepted mix design is based. Testing shall be carried out at such a frequency that the required workability is consistently achieved.

- Samples of concrete shall be taken at random in accordance with IS: 516 at the time and place of deposition of the concrete.

- Notwithstanding the foregoing, additional samples shall be taken by the contractor when directed BRBNMPL/CONSULTANT. The test cube procedure shall be in accordance with IS: 516 throughout.

3.35 Seven-day cube tests: Acceptance of concrete is based on the 28th day results. However, the contractor shall establish a relation ship between 7 days and 28 days strengths by carrying out 7 days tests at the time of performing the laboratory testing and from subsequent quality control testing. This relation ship shall be used in interpreting any further test results to predict the probable value of the corresponding 28 days cube strengths. The contractor shall without delay advise BRBNMPL/CONSULTANT of any sample that appears likely to fail to meet the specification and the contractor shall take any necessary action to minimize the effect of such failure.

3.36 Acceptance Criteria: The general Acceptance Criteria of any and all of the concrete work shall be as per the relevant Clauses of IS. 456. If any of the works tests are not up to the standard, BRBNMPL/CONSULTANT shall have the power to stop the work until the reason is investigated and steps taken to prevent further low results. The contractor shall not be entitled to any claims on account of such delays. Any concrete carried out from the batch that is afterwards found to be faulty, will be liable for rejection and if so directed, the contractor shall at his own expenses dismantle and replace the defective work and any work built thereon or shall take such other measures as may be deemed necessary by BRBNMPL/CONSULTANT.

3.37 Construction joints: Construction joints shall be provided in the position described on the drawings or elsewhere and where not so described on the drawings or else shall be in accordance with the following:

- A joint shall be formed horizontally at the top of a foundation and 75 mm below the lowest soffit of the beams meeting at the head of a column.
- A jont shall be formed in the rib of a large tee beam and all beams 25 mm below the soffit of the slab.
- Concrete in a haunch or a splay on beam or a brace, and in the head of a column where one or more beams meet, shall be placed without a joint at the same time as that in the beam or beams or brace.
- Concrete in the splay at the junction of a wall and slab shall be placed throughout without a joint, but if the provisions of a joint is unavoidable, the joint shall be vertical and the middle of a span.
- A joint in a slab shall be vertical and parallel to the principal reinforcement, where it is unavoidable, at the right angles to the principal reinforcement, the joint shall be vertical and at the middle of the span.

3.38 Expansion joints, hinges or other permanent structural joints shall be provided in the positions and of the form described in the drawings or elsewhere. Before placing new concrete against concrete that has already hardened the face of old concrete shall be cleaned and roughened and scrubbed and loose aggregate removed from the form. Immediately before placing the new concrete the face shall be thoroughly wetted and a coating of neat cement grout applied thereto. The new concrete shall be well rammed against the prepared face before the grout sets.

3.39 Form Work and scaffolding / Staging : Form work to the fresh concrete shall be sufficiently rigid and shall be such as to prevent loss of slurry from the concrete and details and design of the form work shall conform to IS 14687. The tolerances on the shape, lines and dimensions shall be as per CL. 11 of IS 456 –2000. All staging and scaffolding work shall comprise of MS .Pipes / Structural steel sections with necessary coupling arrangement. (NO WOODEN BALLIES / PROPS WILL BE PERMITTED). Adequate size foundation blocks / base plates shall be provide below staging members to disperse the loads as per the founding strata.

3.40 Form work construction

- The concreting should be done in the scientific and methodical manner so as to give a uniform finish in line and level, so that minimum rendering or plastering is done. The work found defective, should be dismantled & redone and site cleared.

- Form work shall be so constructed that concrete can be properly placed and thoroughly compacted. Form work shall be firmly supported and adequately strutted, braced or tied to maintain position and size. Forms shall have sufficient strength and rigidity to with stand the weight of wet concrete and necessary pressure due to ramming and vibration of concrete and movement of men material and other loads without excessive deflection from prescribed limits. It shall be capable of adjustment to the lines, levels and dimensions of the finished concrete.

- All form work shall be constructed to be rigid during the casting of concrete and constructed so that the surfaces adjacent to the concrete are with plus minus 6 mm or the required surfaces when supporting the concrete and sufficiently watertight to prevent loss of liquid from the concrete, and it shall be capable of being removed without shock or vibration to the concrete. Forms shall be cleaned with compressed air immediately before placing concrete to remove all rubbish. The inside faces of the form work shall be treated with a mould oil of type and every care shall be taken to prevent mould oil from getting on to the reinforcement.

- Two full set of shuttering materials for each building to be made availbe at site

3.41 Removal of Form work (Striking Time)

- Unless certainly specified in the drawing, or directed by BRBNMPL/CONSULTANT, the following shall be minimum intervals of time, which should be allowed between the placing of the concrete and the striking of the mould

Walls, column & vertical faces of all structural members Slab	16 to 24 hours as may be decided
Spanning upto 4.50 m	7 days
Spanning over 4.50 M	14 days

*Note: Soffit forms of the slab not to be removed after 3 days,

- Beams and arches
  Spanning upto 6 M 14 days
  Spanning 6 M to 9 M 21 days
  Spanning over 9 M 28 days

*Note:

- The number of props left under, their sizes and disposition shall be such as to be able to safely carry the full dead load of the slabs, beam or arch as the case may be together with any live load likely to occur during curing or further construction.

- However, the Contractor shall delay the removal of shuttering as long as necessary in order to avoid damaging the work.

- The contractor may be required to produce evidence that the concrete has attained a strength sufficient to support the live and dead loads to which that part of the structure may be subjected. This evidence shall consist of reports of compression tests made on job cured test cubes. The foregoing provisions of this clause shall not relieve the Contractor of his responsibility to ensure that

the stability and strength of any structure or part of a structure is not impaired by the release of shuttering.

3.42 Surfaces of concrete: The contractor shall ensure that the finished face of concrete offers a suitable keyed surface for the application of the finishing media, e.g. plaster, sand and cement screed, etc.

3.43 Curing: Canvass, Hessian or other approved screens shall be erected at all points where concrete is being placed to shade the concrete from the direct sun or from drying winds and such screens shall be kept in position until the surface of the concrete has been protected as specified in the following Clauses. The contractor shall be responsible for removing such screens and preparing surface of concrete.

- As soon as possible after it has been placed and concrete shall be covered with Hessian or other approved material to protect it from the sun and all concrete surfaces shall be kept visibly wet continuously for 14 days after placement, the Hessian being kept in position throughout this period.

- The top surface of slab shall be kept flooded with water at all times till the curing period of 14 days is over. Columns, wall and beam sides and other surface shall be completely covered by gunny bags and kept thoroughly wet continuously for the period specified for curing. The ceiling of slabs shall be frequently sprayed with water until the end of curing period.

- Alternatively, curing compound of approved make & as per manufacturer be used.

3.44 Examinations and Repairs: The contractor shall not proceed with the surface finish or making good of concrete surfaces until he has received the permission to do so and he shall not apply cement slurry or mortar or any other coating to the concrete surfaces as struck from the shuttering or do anything else which would hinder the proper inspection of the concrete.

3.45 Concrete which is defective, has honeycombs, or which contains defective parts shall be cut out completely unless BRBNMPL/CONSULTANT agrees that a repair may be satisfactorily effected. This agreement shall not preclude subsequent condemnation of the repaired work.

3.46 The method of repairing defective concrete which the contractor proposes to adopt shall be submitted to BRBNMPL/CONSULTANT for his prior written agreement in each particular case.

3.47 No repairs or remedial work shall be carried out without prior inspection and instructions of the BRBNMPL/CONSULTANT. (No extra shall be paid to the contractor for the repair works).

3.48 Reinforcement Fabrication Bending Schedules: The Contractor shall submit to BRBNMPL/CONSULTANT, for approval, bending schedule for all the works, not less than Ten days before the contractor intends to bend the reinforcing steel. The Approval of BRBNMPL/CONSULTANT shall in no way absolve the contractor of his responsibilities under the Contract.

3.49 Bending and placing reinforcement: Reinforcement shall be cut and bent to the shapes and dimensions shown on the finally agreed bending schedules in accordance with the requirements of IS: 2502 and to the tolerances set out therein. Bending shall be carried out with an appliance which provides a continuous and uniform application of the bending deformation at every section of the bend. There shall be provision for the free movement of the surface of the bar during bending and the bends shall follow the contour of the former without peaking.

3.50 Reinforcement shall be fixed without forcing in the position shown on the drawings within a tolerance of 5 mm or 5% of the minimum dimension of cross section, whichever be the greater and maintained so that it is not displaced during concreting or other operations.

3.51 Where concrete blocks are used, they shall be precast from concrete (not mortar) of the same class as the concrete in which they are to be embedded, except that the largest size of aggregate shall be 10 mm. Each block shall be secured to the reinforcement with wire or a clip embedded in the centre of the block so that, it shall not be in contact with the shuttering or subsequently cause rust marks on the concrete. Intersections of reinforcement shall be bound together with 16 gauge annealed soft iron binding wire.

3.52 Protection of reinforcement and concrete: The Contractor shall ensure that movement of men and material subsequent to steel fixing is organized so that reinforcement is not thereby displaced.

3.53 Cover/Spacer Block: The contractor shall provide approved type of support for maintaining the bars in position and ensuring required spacing and correct cover of concrete to reinforcement as called for in the drawings, spacer blocks of required shape and size. Chairs and spacer bars shall be used in order to ensure accurate positioning of reinforcement.

4. Masonry Works

4.1 Masonry work shall be carried out in conformity of Latest CPWD Specifications for works. Guide lines for chases is masonry walls as per Indian Standard BIS : 1905 need to be followed. The cutting of chases, recesses etc. should be done without damage to the surrounding masonry.

4.2 Solid Block Work: Precast Cement Concrete blocks shall be procured from approved manufactures or manufactured at site. The Solid CC blocks shall have nominal size of 400mm x 200mm x 200mm or 300mmx200mmx200 for 200mm thick masonry wall& Solid/Hollow blocks of nominal size 400mm x 200mm x 100mm or 300x200x100 for 100mm thick masonry wall and 400x200x150mm /300x200x150mm for 150 mm thick walls shall confirm to IS 2185.

4.3 The samples of CC blocks (each sample consisting of 6 specimens) shall be chosen randomly from the lot and tested for various parameters specified below. One samples shall be tested for every 100 cum or part thereof.

4.4 Following parameters shall be tested.

- Compressive strength.
- Water absorption
- Density
- Dimensional Tolerances

4.5 The material shall meet following parameters:

- Compressive strength shall be no less than 5.0 N/sq. mm.
- Water absorption shall not be more than 5%.
- Density shall be not less than 1500 kg/cum.
- Dimensional tolerance in the size shall be not more than + 5mm for length and + 3mm for height and width.

4.6 Nothing extra shall be payable on account of chasing the CC block masonry work for embedding pipes, electrical boards/ boxes etc. and also filling the chases with cement mortar 1:4 (1 Cement: 4 Coarse sand). The chasing shall however be carried out using machine cutters so as not to disturb the joints in the masonry and without any cracks being developed in the masonry.

4.7 Hollow and solid concrete block masonry: Hollow and Solid concrete blocks - shall conform to the requirements of IS:2185-1979. Specification for hollow and solid concrete blocks except with regard to the mix of cement concrete and sizes of aggregates which shall be as indicated. Hollow blocks shall be sound, free from cracks, broken edges, honey combing and other defects that would interfere with the

proper placing of block or impair the strength or performance of construction.

4.8 Dimensions and Tolerances: Concrete masonry building units shall be made in sizes and shapes to fit different construction needs. They include stretcher, corner, double corner or pier, jamb, header, bull nose, and partition block and concrete floor units.

4.9 Concrete block-hollow (open or closed cavity) or solid shall be referred to by its nominal dimensions. The nominal dimensions of concrete block shall be as follows:

- Length 400, 500 or 600mm
- Height 200 or 100mm
- Width 50,75,100,150,200,250 or 300mm

4.10 The maximum variation in the length of the units shall be not more than +5mm and maximum variation in height and width of unit, not more than +33mm.

4.11 Physical requirements: Compressive strength - The average crushing strength of eight blocks, when determined in accordance with IS:2185 – 1979.

4.12 Drying Shrinkage - The drying shrinkage of the blocks average of three blocks, when unrestrained, shall be determined in accordance with IS:2185-1979 and shall not be exceed 0.1 per cent.

4.13 Moisture movement - The moisture movement (average of three blocks) when determined in the manner described in IS:2185-1979, shall not exceed 0.09 per cent.

4.14 Water Absorption - The water absorption (average of three blocks) when determined in the manner described in IS:2185-1979 shall be not more than 10 percent by mass.

4.15 Wetting of blocks: Blocks need not be wetted before or during laying in the walls. Incise the climate condition so require, the top and the sides of the blocks may only be slightly moistened so as to prevent absorption of water from the mortar and ensure the development of the required bond with the mortar

4.16 Laying: Blocks shall be laid in mortar, as indicated and thoroughly bedded in mortar, spread over the entire top surface of the previous course of blocks to a uniform layer of not less than 10mm and not more than 12mm in thickness

4.17 All courses shall be laid truly horizontal and all vertical joints made truly vertical. Blocks shall break joints with those above and below for not less than quarter of their length. Precast half-length closers (and not cut from full-size blocks) shall be used. For battered faces, bedding shall be at right angles to the face unless otherwise directed. Care shall be taken during construction to see that edges of blocks are not damaged.

4.18 STONE MASONRY: Stone masonry work shall comply with all the requirements of IS:1597 Part I (Rubble Stone Masonry) IS:3620 (Laterite Stone Masonry) IS;2185 Part I and IS:2572 (Concrete Block Masonry)

- All stones shall be wetted before use. Each stone shall be placed close to the stones already laid so that the thickness of the mortar joints at the face is not more than 20mm. Face stones shall be arranged suitably to stagger the vertical joints and long vertical joints shall be avoided. Stones for hearting or interior filling shall be hammered down with wooden mallet into the position firmly bedded in mortar. Chips or sprawls of stones may be used for filing of interstices between the adjacent stones in heartening and these shall not exceed 20% of the quantity of stone masonry. To form a bond between successive courses plum stones projecting vertically by about 15 to 20cm shall be firmly

embedded in the heartening at the interval of about one metre in every course. No hollow space shall be left anywhere in the masonry.

- The masonry work in wall shall be carried up true to plumb or to specified batter.

- Random rubble masonry shall be brought to the level courses at plinth, window sills, lintel and roof levels. Levelling shall be done with concrete comprising of one part of the mortar as used for masonry and two parts of graded stone aggregate of 20mm nominal size.

- Bond stones: Bond or through stones running right through the thickness of walls, shall be provided in walls up to 60cm thick and incise of walls above 60cm thickness, a set of two or more bond stones overlapping each other by at least 15cm shall be provided in a line from face of the wall to the back.

- Joints: Stones shall be so laid that all joints are fully packed with mortar and chips. Face joints shall not be more than 20mm thick. The joints shall be struck flush and finished at the time of laying when plastering or pointing is not to be done. For the surfaces to be plastered or pointed, the joints shall be raked to a minimum depth of 20mm when the mortar is still green.

4.19 Cement Mortar: Cement mortar shall meet the requirements of IS:2250 and shall be prepared by mixing cement and sand by volume. Proportion of cement and sand shall be 1:6 (1 part of cement and 6 parts of sand), or shown on the drawing. The sand being used for mortar shall be sieved. The mortar shall be used as soon as possible after mixing and before it has begun to set and in any case within initial setting time of cement after water is added to the dry mixture. Mortar unused for more than initial setting of cement, shall be rejected and removed from the site of work.

4.20 Mixing: The mixing of mortar shall be done in a mechanical mixer operated manually or by power. Hand-mixing as a special case, may be permitted considering the magnitude nature and location of work.

5. Plastering work

5.1 The work shall be done in accordance with KPWD specifications Volume - I & II with correction slips up to the last date of submission of tender documents. All joints between concrete frames and masonry in filling shall be expressed by a groove cut in the plaster. Where grooves are not called for, the joints between concrete members and masonry in filling shall be covered by Chicken wire mesh shall be used over junctions of concrete and masonry or two dissimilar materials about 200mm wide fixed with GI wire nails etc. which shall be in position before plastering

5.2 Preparation of background surface: The surface shall be cleaned off all dust, loose mortar droppings, traces of algae, efflorescence and other foreign matter by water or by brushing. Smooth surfaces shall be roughened by wire brushing or hacking for non- hard and hard surfaces respectively. Projections on surface shall be trimmed wherever necessary to get even surfaces. Incise of brick/stone masonry, raking of joints shall be carried out wherever necessary. The masonry shall be allowed to dry out for sufficient period before carrying out the plaster work, the masonry shall not be soaked but only damped evenly thereafter before applying the plaster.

5.3 For external plaster, the plastering operations shall be started from the top floor and carried downwards. For internal plaster, the plastering may be started wherever the building frame, roofing, and brickwork are ready.

5.4 Damage rectification: Any cracks, damages, any part of work which sound hollow when tapped or found damaged or defective otherwise shall be cut out in rectangular shape and redone as directed.

5.5 Curing: Curing shall be started 24 hours after finishing the plaster. The plaster shall be kept wet for a

period of 7 days. During this period, the plaster shall be suitably protected from all damages at the contractor's expense. The date of execution of plastering shall be marked on the plastering to ensure the proper duration of curing.

5.6 Thickness of the plaster shall be the minimum thickness at any point on a surface and shall be exclusive of the key i.e. grooves or open joints in masonry. No extra payment shall be allowed for extra thickness of plaster done by contractor, drip moulds, rounding of edges making grooves, etc.,

5.7 The wire mesh shall be of 24 gauge and it shall be fixed with nails at the junction of brick masonry and RCC elements. The chicken wire mesh shall not sag in between the nails. This shall be done before the application of plaster. It shall be measured in sq. Measurement shall be taken before the application of the plaster. The rate includes for carrying out the work at all heights.

6. Painting Works

6.1 All types of paint, polish, primer to have low VOC content as per the requirement of GRIHA RATING. The contractor will need to submit all relevant documents to BRBNMPL/CONSULTANT pertaining to the same.

6.2 All materials required for the execution of painting work shall be obtained direct from approved manufacturers and shall be brought to the site in makers drums, keys etc., with seals unbroken. If in case of ready mixed paints, thinning if necessary the brand of thinner shall be as per recommendations of the manufacturer

6.3 Paint shall be applied by brushing or spraying. The brushing operations are to be adjusted to the spreading capacity advised by the manufacturer.

6.4 Spray machine used may be of high-pressure type or low pressure depending on the nature and location of work. After work, the brushes shall be completely cleaned off paint and shall be hung in a thinner if intended to be used afterwards. The spray guns shall be cleaned thoroughly after every break in work. The paint containers, when not used shall be kept close and free from air.

6.5 Spray machine used may be of high-pressure type or low pressure depending on the nature and location of work.

6.6 Plastic emulsion paint shall conform to IS:5411 (Part-1) and shall be of approved shade. Preparation of mix shall be as per manufacturer's instructions.

6.7 The paint mix shall be continuously stirred while applying for maintaining uniform consistency. Number of coats shall be as per item description. The painting shall be laid evenly and smoothly by means of crossing and laying off. The crossing and laying off consists of covering the area with paint, brushing the surface hard at first, then brushing alternately in opposite direction 2/3 times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks, no hair marks no clogging of paint puddles shall be permitted. The full process of crossing and laying off will constitute one coat.

6.8 Before starting painting with plastic emulsion paint, the prepared surface shall be treated with two coats of primer consisting of cement primer, whiting and plastic emulsion paint shall start only after the preceding coat has become sufficiently hard to resist brush marking. Subsequent coats of plastic emulsion paint shall also be started after the preceding coat is dried by evaporation of water content.

6.9 Exterior Grade Texture Paint:

- This paint shall be executed on all exposed surfaces of building like parapet, machine room,

Staircase, other locations, exposed soffits etc. as mentioned in elevation drawings in three coats of finishing paint, approved texture pattern, with one primer. Shade and colour of paint and texture pattern shall be as approved by Engineer-in charge. The work shall be carried out as per KPWD specifications.

- Preparation of Surfaces: All oil, grease, dirt, dust, loose mill scale and any other foreign substance shall be removed from the surface to be painted, polished and white washed by the use of solvent and clean wiping materials. In the event the surfaces become otherwise contaminated in interval between cleaning and painting, re-cleaning will be done by the contractor at no additional cost. All surfaces to be painted with approved quality paints shall be free from dust, dirt, fungus, lichen, algae, etc.

- For the coat of primer and the paint works, the contractor need to make sure that all the temporary features and removable items such as power points etc are to be mounted down before the application of the paint or primer.

- Where so stipulated, the painting shall be carried out using spray machines suited for the nature and location of the work to be carried out. The application of paint, especially on the main gates and other external feature shall be applied with spray machines as mentioned. Only skilled and experienced workmen shall be employed for this class of work.

7. DOOR & WINDOWS

7.1 Wood: well-seasoned Nandi / Matti wood frames for door

7.2 The moisture contents of the wood used in the work shall not be more than that stipulated in the relevant clause of Latest KPWD Specifications for works. Kiln seasoning and preservative treatment of wood, if required, shall be done by the contractor. In all other respects the wood used in the work shall conform to the provision in latest KPWD specification for works.

7.3 The sample of species to be used shall be deposited by the contractor with the BRBNMPL/CONSULTANT before commencement of the work.

7.4 Flush door shutters shall have to be specified make door / or equivalent to conform manufactures specifications. Thickness and type of shutters shall be as specified. The shutters shall have a solid core and may be of decorative or non-decorative (paintable) as per IS 2202 (Part IS:) 1991. Thickness and type of shutter shall be specified. Lipping shall be done with battens of first-class hard wood or as specified and of depth not less than 25mm and provided internally on all edges of shutters. Hinges sall be as specified in Bill of quantities.

7.5 Panelled or glazed shutters for doors, windows, ventilators and cupboards shall be constructed in the form of timber frame work of stiles and rails with panel inserts of timber, plywood, block board, veneered particle board, fibre board wire gauge or sheet glass, the shutters, single or multi- panelled as shown in the drawings. All members of the shutter shall be straight without any wrap or bow and shall have smooth well-planned face at right angles to each other.

7.6 Hardware: All hardware for doors and windows shall be of brass as per the specification. All the hard wares shall be approved by Architect / Engineer in-charge of work. All hardware shall be installed using routers and counter sunk screws All the hard wares to confirm to IS normal

7.7 The contractor shall procure all the hardware and get approval from the Architect / engineer in charge before fixing. The fixing shall be done in the best workmanship like manner and in accordance with that employed for fixing hardware.

8. Powder coated Aluminium Works

8.1 Fabrication, supply and erection at site of all types of Aluminium glazed doors, windows and ventilators shall be carried out in accordance with the drawings and specifications.

8.2 The supply and erection will include all parts such as but not restricted to frames, tracks, guides, mullions, styles, rails, couplers, transoms, rails, plates glazing bars, glass, hinges, arrangement, spring catches, cord and pulley arrangements, spring catches, cord and pulley arrangements door closers floor springs etc., required for the whole work whether the parts/ items are individually and specifically referred to in the schedules/ specifications/drawings or not provided that the supply and installation of such parts can be inferred there from and are necessary to make the work complete, unless separate provision is made in the bills of quantities for supply to such parts/items.

8.3 The doors, windows, ventilators, will be fabricated to suit the finished clear openings in the building/structure which the tenderer will himself measure.

8.4 Materials: -The members will be made out of aluminum alloy corresponding to IS:733 and will consist of extruded sections and of other shapes, and to sized gauges as shown in the drawings/ described in accordance with the relevant IS codes. The members shall be chosen to provide strength/ stability and maximum resistance to wear and tear.

8.5 Fabrication:

- Before commencing the fabrication the contractor shall submit to the BRBNMPL/CONSULTANT for their approval detailed shop drawings, based on the approved Architectural drawings and corresponding specification showing junctions, fittings, accessories such as hinges flush bolts, locks, latches, latching arrangements, sealant etc., including fixing and sealing arrangements. Fabrication is to be taken up only after approval by the BRBNMPL/CONSULTANT and in accordance with the approved drawings. Sections for fabrication of door/ window/ventilators etc. shall be as per architectural drawings.

- A sample of finished door / windows/ ventilator railing etc. shall be fabricated as per the shop drawings approved by the BRBNMPL/CONSULTANT for final approval before under taking mass production/ fabrication,

- The doors, window, ventilators and partitions shall be as per thickness given in the approved shop drawings.

- All materials shall conform to relevant IS. Codes and in the absence of IS code, they should correspond to the best engineering practice; decision of the BRBNMPL/CONSULTANT shall be final and binding on the contractor.

- Fabrication shall be done true to the drawing/ sample approved and in correspondence to the finished openings at the site. All joints shall be mitered at the corners, true right angles, and joints to be finished neatly to hairlines, with concealed fasteners, wherever possible joints shall be made in concealed locations.

9. EXTERNAL FAÇADE WORKS:

9.1 Wet cladding: The wet cladding if specified in DBR/ Tender drawings shall be laid as per design and in accordance with KPWD Specifications, including SS metal cramps, pins, dowels, ledges and supports, as per design and requirements. The cladding shall be fixed with 12mm thick (minimum), Cement Mortar 1:3 (1cement: 3 coarse sand). Horizontal & vertical joints shall be filled with white cement mixed with pigment of matching shade.

9.2 Structural Glazing System: The contractor shall design, engineer, test, fabricate, deliver, install, and

guarantee all construction necessary to provide a complete structural glazing system to the proposed building, all in conformity with the Drawings as given. Specification and all relevant construction regulations including providing any measures that may be required to that end, notwithstanding any omissions or inadequacies of the Drawings and/or without limiting the generalities of the foregoing, the structural glazing Systems shall include, without being limited to, the followings:

- Metal frames, glass glazing, spandrels, ventilators, finish hardware, copings metal closure, windows etc.
- All anchors, attachments, reinforcement and steel reinforcing for the systems required for the complete installations.
- All thermal insulation associated with the system. All fire protection associated with the system.
- All copings, end closure and metal cladding to complete the system.
- All sealing and flushing including sealing at junctions with other trades to achieve complete water tightness in the system.
- Isolation of dissimilar metals and moving parts.
- Anticorrosive treatment on all metals used in the system. Polyester powder coating aluminum sections.

9.3 The contractor shall also be responsible for providing the followings:

- Shop Drawings, Engineering data and Structural Calculations in connection with the design of the structural glazing System.
- Mock-ups, samples and test units.
- Performance testing of the structural glazing framing and glazing assembly.
- Co-ordination with work of other trades.
- Protection.
- All final exterior and interior cleaning and finishing of the structural glazing System
- As-built record drawings and photographs.
- Guarantees and Warranties.
- All hoisting, staging and temporary services.

9.4 The water tightness and structural stability of the whole structural glazing System are the prime responsibility of the Contractor. Any defect or leakage found within the Guarantee Period shall be sealed and made good all at the expense of the Contractor.

9.5 The structural glazing system shall be designed to provide for expansion and contraction of components which will be caused by an ambient temperature range without causing buckling, stress on glass, failure of joint sealants, undue stress on structural elements or other detrimental effects. Specific details should be designed to accommodate thermal and building movements.

9.6 Structural glazing shall comply with all Government Codes and Regulations including IS codes, if any.

9.7 All structural glazing, individual aluminum and glass components and all completed work shall be designed and erected to comply with the following:

- Design load and deflection.
- Structural glazing construction in its entirety shall be fabricated and erected to withstand without damage or permanent deformation inward (positive) and outwards (negative) pressure.
- Structural performance of all parts of structural glazing system shall conform to relevant IS codes, wind load as per IS-875 and seismic loads as per IS- 1893.

9.8 Tender Drawings and Specifications: The tender drawings indicate profile and configuration required together with relationship to structural frame and interior building elements. The Specification and tender drawings is of the performance type and includes only the minimum requirements of the /structural glazing Wall System without limiting the Contractor to the method of achieving desired performance.

9.9 The contractor shall propose the final design in such a way that all basic functional and architectural requirements in line with the Master Plan, Concept Plans & Design Basis Report are fulfilled and get the same approved by BRBNMPL/CONSULTANT. However, basic design requirements as described in the specification and other Architectural requirements such as the size of window, net glass area, ventilator, configuration of windows and spandrels shall be retained. The design proposals shall be in the form of drawings, drawn to full scale as far as practical and specification shown in or describing all items of work including:

- Request details as indicated on the tender drawings.
- Metal quality, finishes and thickness.
- Glass quality, coating and thickness and proposed manufacturer's brand names.
- Field connections especially mullion to mullion and transom to mullion.
- Fixing and anchorage system of typical wall unit together with structural calculations.
- Drainage system and provision in respect of water leakage in the curtain wall/structural glazing system.
- Provisions for thermal movements.
- Sealant and sealing method.
- Glazing method.

9.10 The maximum permissible structural tolerances of the building that the system has been designed to accommodate in case this tolerance exceed those specified in the Specification. Any parts of the curtain wall/structural glazing, when completed, shall be within the following tolerances:

- Deviation from plumb, level or dimensioned angle must not exceed 3mm per 3.5m of length of any member, or 6mm in any total run in any line.
- Deviation from theoretical position on plan or elevation, including deviation from plumb, level or

dimensioned angle, must not exceed 9mm total at any location.

- Change in deviation must not exceed 3mm for any 3.5m run in any direction.

9.11 Samples: The contractor shall also submit samples of mullion and transom sections in lengths of 300mm with the same finish and workmanship along with the proposals and 300mmx300mm samples of glass (samples to include exposed screws and other exposed securing devices, if any).

9.12 Execution- Performance Testing: The performance tests are to be conducted on the structural glazing system, if the area of the structural glazing system exceeds 2500 Sqm from the certified laboratories accredited by NABL (National Accreditation Board for Testing and Calibration Laboratories), Department of Science and Technology, India. The decision of the BRBNMPL/CONSULTANT about the necessity of testing of shall be final and binding.

9.13 Shop Drawings and Calculations for the Performance Testing: Prior to fabrication of Test Unit, the Contractor shall submit shop drawings and calculations of the Test Unit for BRBNMPL/CONSULTANT `s approval.

9.14 Performance Guarantee: The tenderer shall provide a performance guarantee as specified in the Specific Conditions of Contract for a period of five years, to provide for expenses, to cover the risk and cost of rectification of defect, noticed during the five years guarantee period. Guarantee period to start from the date of completion of the project.

10. RAILING, GRILL WORK AND FENCING:

10.1 Grill Work:

- MS Grills shall be provided in the windows made out of mild steel sections as specified in the tender drawings

- All steel grills shall be according to the approved detailed drawings and shall conform to Latest KPWD Specifications.
-
- On MS grills an approved quality priming coat of zinc chromate shall be applied over and above a shop coat of primer and finished with two or more coats of low VOC synthetic enamel pain of approved make and shade/ powder coating as specified.

10.2 Railing : To be provided as specified in the tender drawings

10.3 MS Railing: As per architectural and structural member including painting with synthetic enamel paint &primer coat complete/ powder coated as specified in drawings and as per KPWD specifications.

10.4Stainless Steel Handrail without Glass: Fabricating, Supplying and Fixing in position SS Staircase Handrail with Top hand rail of a Hollow SS pipe of to be welded as railing connected to the verticals through connecter plate with flat base plate below the hand rail. All sections to be of grade304.The Contractor to submit the shop drawing of the same including the fabrication details, calculations and stability report. The work to start only on written approval of the same by the Engineer – in-charge.

11. STRUCTURAL STEEL

11.1 General: This specification covers the fabrication and transportation to site and erection on prepared foundations and structural steel work consisting of beams, columns, purlins, vertical trusses, bracings, shear connections etc.

11.2 Fabrication, erection and approval of steel structures shall be in compliance with General Specifications mentioned in KPWD specifications with up to date correction slips and IS: 800 – 1984. For the guidance

on general fabrication and erection of structural steel work, Chapter 11 of IS: 800 (1984) must be followed. As far as safety is concerned guidance could be obtained from Indian safety code for structural steelwork IS: 7205(1974). Before the commencement of the erection, all the erection equipment tools, shackles, ropes etc. should be tested for their load carrying capacity. Such tests if needed may be repeated at intermediate stages also.

11.3 Providing shop primer coat for steel structures. Grouting of holding-down bolt pockets and below base plates where required.

11.4 Scope: The fabrication and erection of the steel work consists of accomplishing of all jobs here-in enumerated including providing all labour, tools and plant all materials and consumables such as welding electrodes, bolts and nuts, oxygen and acetylene gases, oils for cleaning etc. of approved quality as per relevant IS. The work shall be executed according to the drawings, specifications, relevant codes etc. in an expeditious and workman like manner, as detailed in the specifications and the relevant Indian Standard Codes and Standard Practice and to the complete satisfaction of the BRBNMPL/CONSULTANT.

11.5 Materials

- Rolled Sections: Structural steel will generally be of standard quality conforming to IS: 226/IS: 2062. Whenever welded construction is specified plates of more than 20 mm thickness will generally conform to IS: 2062.

- Welding Materials: Welding electrodes shall conform to IS: 814 and approval of welding procedures shall be as per IS: 823.

- Bolts, Nuts & Washers: Bolts and nuts shall be as per IS: 1367 and tested as per IS: 1608.

- All materials shall conform to their respective specifications. The use of equivalent or higher grade or alternate materials will be considered only in very special cases subject to the approval of the Engineer-in-charge in writing.

11.6 Material Tests

- The contractor shall be required to produce manufacturer's quality certificates for the materials supplied by the contractor. Notwithstanding the manufacturer's certificates, BRBNMPL/CONSULTANT may ask for testing of materials in approved test houses. The test results shall satisfy the requirements of the relevant Indian Standards.

- Whenever quality certificates are missing or incomplete or when material quality differs from standard specifications the contractor shall conduct all appropriate tests as directed by the BRBNMPL/CONSULTANT at no extra cost.

12. FLOORING:

12.1 The flooring in the building shall be as per the approved finishing schedule / Tender drawings and laid in such a way that limits in floor levels would not exceed the limits provided in the latest KPWD specifications or manufactures specifications.

12.2 In order to keep the floor finish as per direction of BRBNMPL/CONSULTANT and as per Finishing Schedule of Architectural drawings and to provide required thickness of the flooring as per specification, the level of top surface of RCC shall be accordingly adjusted at the time of its centering, shuttering and casting.

12.3 Wherever Vitrified Tile flooring is done, it shall be with 1st Quality multi-grade/multi- range tiles double

charged and the sample to be approved by BRBNMPL/CONSULTANT.

12.4 Slope in floors shall be provided as per architectural drawings, else the levels at any place when checked over a distance of one meters in any direction should not show variation in floor level more than 3 mm.

12.5 Minimum Bed mortars for various types of flooring

- Chequered tiles/stone flooring/granite flooring/ Ceramic glazed floor tile flooring/vitrified flooring - 20mm thick bed of cement mortar 1:4 (1 cement: 4 coarse sand). Anti-Acid Tiles- 10 mm thick epoxy resin based adhesive.

- For dado, skirting and risers of steps in Chequered tiles/stone / granite / Ceramic glazed floor tile /vitrified tiles- 12mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand).

- The vertical facia and drops shall be finished with epoxy resin-based adhesive.

12.6 Granite Work (Samples to be approved by BRBNMPL/CONSULTANT)

- The granite stonework shall, in general, be carried out as per the KPWD Specifications and relevant specification for marble flooring, skirting, dado and tread/risers of steps under Flooring Sub Head of the KPWD Specifications shall prevail.

- Granite stone slabs shall be pre polished (mirror polished), eggshell polished, flame finished or given any other surface treatment as specified, as per the BRBNMPL/CONSULTANT/ architectural drawings. Machine polishing and cutting to required size shall be done with water (as lubricant) only. Tiles / slabs with stains or patches due to the use of oil or otherwise, either before or after installation, shall be rejected and shall be replaced by the Contractor at his own cost. Nothing extra shall be payable on this account.

- The decision of the BRBNMPL/CONSULTANT as regards the approval of the samples for the various types of the granite stones shall be final and binding on the Contractor.

- The entire supply for each type of granite stone slab shall be procured from one location (in one quarry), and supplied preferably, in one lot to keep variations to the minimum. The Contractor shall also segregate and sort the slabs according to colour, shade, texture and size of grains etc. to keep variation(s) in stones used at any one floor to the minimum. Any slab with variation in the colour, shade, texture and size of grains etc., not acceptable to the BRBNMPL/CONSULTANT, shall not be used in the work and shall be removed and replaced by the Contractor.

- The stone work may be required to be carried out in patterns, design and / or in combination with granite stones of different colour and shade with or without borders and in combination of different stone slabs / ceramic tiles for which nothing extra shall be payable. The stones shall be provided in sizes and shapes as per the approved BRBNMPL/CONSULTANT architectural drawings and wastages and incidental costs, if any, shall be deemed to be covered in the tendered rats. Nothing extra shall be payable on this account.

12.7 Terrazzo Flooring

- SCREED CONCRETE OVERLY [FOR TERRAZZO]

- SURFACE PREPARATION: - Mechanically abrading base concrete surface to achieve CSP [concrete surface profile] of 5-8. High pressure water jetting/blowing with air, cleaning thoroughly, wet vaccum cleaning to remove excess water to achieve SSD [saturated surface dry] condition.

- AUXILIARY REINFORCEMENT: -Providing and fixing auxiliary reinforcement at specified locations of 8 mm dia mesh reinforcement in the floor as per detailed drawing with proper covers, chairs wherever required, including cracker beams at the corners of the columns. [steel r/f providing and fixing civil contractor's scope, not considered in rates.

- PRIMER: - Priming the damp base concrete surface using cement slurry mixed with Accreted bonding additive at 10% by wt of cement applied with brush, spray or roller.

- SCREED CONCRETE OVERLAY: - Providing & laying 50 mm thick M25 grade shrinkage controlled screed concrete using OPC 43/53 grade. Mixing shrinkage control additive Avcrete SCC at recommended dosage ,Keeping minimum cement content 325 kg/Cum and not exceeding 375 kg/Cum including coarse & fine aggregates of specified gradation. Providing and fixing adjustable MS/wooden formwork of approved design, laying in panels ofapprove size, compacting using screed vibrator,levelling with levelling tools,finishing smooth/semi-smooth using prower trowel,curing by sprinkling water and covering with LDPE sheet for the period of 8-10 days. Surface regularity to achieve SR 1 class as per BS 8204.

- CONSTRUCTION & SAW CUT JOINTS:- Cutting grooves at design joint locations to form groove of 4mm width x 25-30mm depth within 18-36 hours of placing concrete at saw cut & after opening of joint at construction joint, cleaning throughly and filling compressible backing rod of 5-6mm diameter.

- ISOLATION JOINTS:- Providing 25 mm wide isolation/ seperation joints in the floor for the full depth of concrete around columns, fixed structures, etc, including fixing compressible board or sheet, sealing top 12mm depth of concrete with Polyurethane based sealant ROC JOINT PU B925.

- CEMENTITIOUS TERRAZZO SYSTEM: Wet-on-Wet Terrazzo System-Colour Harder with Densification & polishing

- TERRAZZO TOPPING:- Providing & laying WET-ON-WET topping of colored abrasion resistant harder, QUALITOP MASTER [having abrasion class of AR 2 as per BS 8204] of ROCLAND make, mixed with pre-mix colour aggregates chips at desired proportion in pan mixer at dosage rate of 30-32kg/Sqm inslurry form over levelled green concrete as wet on wet system.[French Grey/Light Grey/Salmon/Ivory/ Anthracites black/Buff/Yellow].

- FLOOR GRINDING, GROUNDING,POLISHING & SEALING:-Diamond grinding concrete floor surface after minimum cure period of 28 days[moisture content less than55 and Moh's scale exceeding 5], Grinding with series of diamond bonded abrasives to achive desired aggregate exposure, providing and applying Lithium Based Densifier DENSIROC, grouting with ROC FILLER,polishing with series of resin bonded polishing pads[wet/dry polishing] to achieve Glossy surface, providing and applying stain resistant sealer RINOL PERFORMANCE PLUS in coats and light buffing.

13. FALSE CEILING

13.1 General: The types of false ceiling in appended in tender drawings and to be as per latest KPWD specifications or manufactures the buildings shall be as per the approved finishing schedule specifications complete in all respect with Suspension system, cutouts for lights & AC fixtures/ diffusers, fire detectors etc. Various type of false ceiling is briefed as under:

- False ceiling with gypsum board of size 1.2x2.4x12.5 mm thick

- Gypsum false ceiling with coves

- 8mm thick calcium silicate board false ceiling.

13.2 Location of particular type of false ceiling shall be as per relevant drawing, in its absence written approval of the BRBNMPL/CONSULTANT shall be obtained.

13.3 Trap doors, as required, of approved size and design shall be provided.

13.4 The false ceiling to be supported with necessary MS members supported through truss as per the design . The shop drawings of ceiling and support system to be prepared by the contractor at his own cost before excitation.

14. WATER PROOFING

14.1 All the items for water proofing treatment with PU based single component elastomeric pure polyurethane water proofing treatment for roof slab and sunken portion shall be guaranteed for FVE YEARS, to be reckoned from the date of expiring of the Defect Liability period prescribed in the contract. The Guarantee shall be furnished by the contractor as per Performa prescribed.

14.2 The Type of Waterproofing shall be carried out as specified in Finishing Schedule / DBR/ Tender Drawings as per latest KPWD Specifications/Manufacturer Specifications.

14.3 The treatment for water-proofing of basement, roofs, water retaining areas shall be of type and specifications as given in the tender drawings/ DBR and remain fully effective for a period of not less than 05 (FIVE) years to be reckoned from the date of expiring of the Defect Liability period, prescribed in the contract. At any time during the said guarantee period if BRBNMPL/CONSULTANT finds any defects in the said treatment or any evidence of re-infestation, dampness, leakage in any part of buildings or structure and notifies the contractor of the same, the contractor shall be liable to rectify the defect or give re-treatment and shall commence the work or such rectification or re-treatment within seven days from the date of issue of such letter to him.

14.4 If the contractor fails to commence such work within the stipulated period, the BRBNMPL/CONSULTANT may get the same done by another agency at the Contractor's cost and risk and the decision of the BRBNMPL/CONSULTANT for the cost payable by the contractor shall be final and binding upon him. Re-treatment if required shall be attended to and carried out by the Contractor within seven days of the notice from the BRBNMPL/CONSULTANT.

14.5 The work shall be got executed from the specialized agency

14.6 Total quantity of the water proofing compound required shall be arranged only after obtaining the prior approval of the make by BRBNMPL/CONSULTANT in writing. Materials shall be kept under double lock and key and proper account of the water proofing compound used in the work shall be maintained. It shall be ensured that the consumption of the compound is as per specified requirements.

14.7 10% of the assessed value/ cost of water proofing work as finalized by Engineer- In-Charge shall be retained as additional security deposit and the amount so withheld would be released after five years from the date of issue of Final Completion Certificate of the entire work under the agreement. If the performance of the work done is found unsatisfactory and any defects noticed during the guarantee period, they shall be rectified by the Contractor within seven days of receipt of intimation of defects in the work. If the defects pointed out are not attended to within the specified period, the same will be got done from another agency at the risk and cost of the Contractor.

14.8 Water Proofing Treatment Integral Cement Based Water Proofing Treatment.

- The Water proofing treatment of terrace shall be done as per specification detailed below:

- Surface Preparation: Cleaning of the surface, treating of construction joints, filling of honeycombs etc. of slab to be carried out before executing water proofing treatment.

- Applying over the cleaned surface instant setting spray polyurethane waterproofing system of 10 mm thickness with a density of minimum 55 kg /m3, having fire resistance property confirming to class B2 as per DIN 4102; having min 96% closed cell content of approved make and as per the manufacturer's recommendations.

- Over above layer, providing and applying, water proof membrane of liquid of pure polyurethane based, single component, low VOC, elastomeric, seamless & having solid content 90% (as per ASTM C836), elongation at break of 400%. The membrane to be applied with a brush/roller in 2 coats to achieve a DFT of 0. 70mm (consumption @ 1.0 kg/Sqm).

- Over the above membrane Geotextile 150 gsm (non-woven polyester) to be spread.

- The Water proofing treatment shall be of approved make and guaranteed for FIVE YEARS, to be reckoned from the date of expiring of the Defect Liability period prescribed in the contract

15. ROOFING

15.1 POLYCARBONATE SHEET ROOFING

- The polycarbonate sheet roofing as specified in Tender drawings/ DBR shall be of approved make and shall conform to manufacture's specifications. The material procured shall be free of any defects and damage to the edges, surface etc. The contractor shall ensure that the material is procured and delivered at installation site without any damage.

- The polycarbonate sheet shall be multi-wall (twin wall) section with thickness of the sheet not less than 16mm and the thickness of the walls on the two external faces not less than 0.8mm each. The sheet shall be extruded from polycarbonate material and shall have homogeneous composition of the material. The sheet shall have co-extruded UV protective layer. The sheet shall be fixed with the face treated for UV resistance, upward/exposed to sunlight. The weight of the sheets shall not be less than 2.7 Kg per sq.m. Light transmission shall be minimum 35% or as per manufacturers specifications. The sheets shall be obtained with closed edges. The sheet shall be bent (if required) to the require profile as per the architectural drawings but with radius not less than 175 times the thickness of the sheet. The sheet shall be fixed in a manner that the cells are parallel to the span of the shed.

- The polycarbonate sheets shall be of colour and shade as approved by the BRBNMPL/CONSULTANT.

- The physical and the chemical characteristics of the polycarbonate sheets shall be as per the manufacturer's specifications and shall conform to the ASTM standards. The sheets shall conform to BS 476 part 7 for the fire rating.

- The polycarbonate sheets shall be obtained with protective films on both sides. Care shall be taken while fixing to fix the sheets with UV protected side exposed to outside. The sheet shall be stored in a manner not to expose to direct sunlight. The sheet shall be cut to the required size or drilled using the toothed blade/machine. After fixing the protective film shall be removed and the sheets cleaned using non-alkaline based detergent and abrasive equipment's or solvents be avoided. The silicones, gaskets, tapes etc. shall be compatible with the polycarbonate sheet.

Note:

The following is the list of approved make/brand against each product. Where more than one brand has been specified. Contractor is to quote rates based on the materials of 'first preference' after ascertaining availability, delivery schedules and other parameters affecting

delivery. Unless the Contractor stipulates to the contrary in his tender, it shall be assumed that the rates quoted are for materials of first preference.

LIST OF APPROVED MAKES OF MATERIALS

SL. NO.	ITEM	APPROVED MAKES
1	TIMBER	APPROVED SAMPLE AND MAKE
2	PLYWOOD COMMERCIAL GRADE	CENTURY, GREENPLY, ARCHID PLY, SOMANI PLY
3	PLYWOOD MARINE GRADE	CENTURY, GREENPLY, ARCHID PLY, SOMANI PLY
4	DECORATIVE LAMINATES	GREENLAM, MERINO, ARCHIDPLY, Sunmica
5	MDF / HDF	GREEN PANEL, CENTURY MDF, SOMANI MDF
6	WOOD VENEER	GREENLAM (veneer), JACKSON (veneer), URO (veneer)
7	SOFTBOARD	CELOTEX OR APPROVED EQUIVALENT
8	GLASS, MIRROR	SAINTGOBAIN, ASAHI
9	LAQURED GLASS	SAINTGOBAIN, ASAHI
10	HERMETICALLY SEALED DOUBLE GLAZING	IMPACT SAFETY GLASS, GSCTOUGHENED GLASS, NOIDA, TUFFGLAZE INDIA Pvt Ltd, NAVI MUMBAI
11	ACRYLIC EMULSION PAINT	ASIAN PAINTS, BERGER, ICI DULUX
12	SYNTHETIC ENAMEL	ASIAN PAINTS, BERGER, ICI DULUX
13	TEXTURED PAINT	OIKOS, ASIAN, ARMOUR COAT
14	AUTOMOTIVE PAINT	ICI, ASIAN, BERGER
15	ANTI-TERMITE PAINT	WOOD CARE, WOOD GUARD
16	MELAMINE POLISH	MRF, LIGHT HOUSE, SHEENLAC
17	PATCH FITTINGS	DORMA, GEZE
18	FLOOR SPRING	DORMA, GEZE
19	FLOOR SPRING FOR OTHER DOORS	DORMA, GEZE
20	EXPOSED / CONCEILIED DOOR CLOSER	DORMA, GEZE
21	BEARING HINGES	DORMA, GEZE
22	MORTISE HANDLE	DORMA, GEZE
23	DEAD LOCK	DORMA, GEZE
24	MORTISE LOCK CYLINDER	DORMA, GEZE
25	PATCH DOOR HANDLE	DORMA, GEZE
26	FLOOR MOUNTED DOOR STOPPER	DORMA, GEZE
27	CONCEALED TOWER BOLT	DORMA, GEZE
28	TOILET DOOR INDICATOR BOLT	DORMA, GEZE, KICH IB 106 SS
29	MULTI-PURPOSE LOCK	DORSET MP 300 SS WITH 3 KEYS, GODREJ, EBCO
30	CABINET HINGE (AUTO CLOSING)	HAFELE, BLUM, EBCO
31	DRAWER SLIDE SYSTEM (TELESCOPIC CHANNEL)	HAFELE, BLUM, EBCO

32	AUTO DOOR BOLT	HAFELE, BLUM, EBCO
33	CABINET HANDLES 96 MM	HAFELE, BLUM, EBCO
34	SCREWS (JOINERY WORKS, HARDWARE, FITTINGS)	NETTLEFOLD IS 1365, GI screws, SS STAR HEAD SCREW AS PER MANUFACTURERS SPECIFICATION
35	FOAM RUBBER	U FOAM, KURLON, MM FOAM
36	VITRIFIED TILES	KAJARIA, SOMANY, JOHNSON
37	SILICON SEALANT	DOW CORNING, HILTI, ARDEX
38	GREY CEMENT	L&T 43 GRADE, CORAMANDAL 43 GRADE, ACC
39	WHITE CEMENT	JK WHITE CEMENT, BIRLA WHITE, APPROVED EQUALENT
40	FROSTED FILM	3MLUMARULTRAMARK
41	COMPOSITE ALUMINIUM INTERIOR GRADE (3MM THICK)	ALUCOBOND, TIMEX BOND, EURO BOND
42	FABRIC	ATMOSPHERE, DDECOR, RESPONSE
43	FIBRE GLASS WOOL	UP TWIGA, KIMCO, ROCKWOOL
44	ACOUSTC PANELS	FELTECH ACOUPANEL, WOVEN IMAGE, ARMSTRONG
45	OIL BASED DISTEMPER	ASIAN, ICI, BERGER
46	STAINLESS STEEL	SAIL STEEL 304 GRADE, JINDAL, ESSAR
47	ANTI-STATIC VINYL FLOORING	TARKETT, ARMSTRONG, GERFLOR
48	VINYL FILM	3M, LG
49	ALUMINIUM SECTIONS	JINDAL, talco, APPROVED EQUALENT
50	GI SECTION FOR PARTITIONS & FALSE CEILING	INDIA GYPSUM, SAINT GOBAIN, DIAMOND FRAMES, AEROCON PANEL
51	GLASS MOSAIC	TILE ITALIA, PALLADIO
52	FALSE FLOORING	UNITED INSULATION, TESCO, UNICOS
53	ALUMINIUM SKIRTING	BOTTOM LINE, TESCO, wall line/Vdica
54	WALL PAPER	ARTE, ENGRAPHICS, MARSHALL
55	WATER PROOFING	FOSROC, SIKA INDIA PVT.LTD, PIDLITE, ARDEX
56	ROLLER BLINDS	LOUVERLINE, WALL TRACTS, HUNTER DOUGLAS, VISTA
57	MODULAR GRID CEILING	ECOPHONE, ARMSTRONG, USG
58	SANITARY & CP FIXTURES	KOHLER, GROHE, PARYWARE, HINDWARE
59	GYPSUM BOARD	SAINT GOBAIN , BORAL BOARDS ,AEROCON PANEL
60	GLASS PARTITION SYSTEM	BOTTOMLINE, INFRASYS, VEDIC
61	SLIDIDNG FOLDING PARTITION	DORMA, GEZE, MALROX
62	EPOXY FLOORING	ROFF, FOSROC , APPROVED EUQUIVALENT
63	EXPANDED METAL CEILING	HUNTER DOUGHLAS, LD2 TECHNOLOGIES, LINDNER, FAMELINE
64	BAFFLE CEILING	ARMSTRING, METAL MATRIX, LD2 TECHNOLOGIES
65	PVC STRETCH FABRIC CEILING	EUROCEL, BARRILUX , BARRISOL
66	FIRE RATED DOOR	SHAKTIMATE, MPP DORTEC, CORUSCUND
67	AUTOMATIC SLIDIDNG DOOR	DORMA, GEZE
68	SOLID SURFACE	DUPONT - CORIAN ,HANEX , LG, SAMSUNG
69	TENSILE FABRIC	FERRARI, VISTA, APPROVED EUQUALENT
70	SS SINK WITH DRAIN BOARD	NIRALI, FUTURA, FRANKY - FABER, APPROVED EUQUALENT

71	COMPACTORS	GODREJ, SAFEGUARD SYSTEM, METHODEX
72	SLOTTED ANGLE STORAGE	GODREJ, PAN INDIA SYSTEMS, APPROVED EUQUALENT
73	TMT FE -500/415	TATA, SAIL, RINL (VIZAG), JSW, ESSAR, STEEL, SANGHI, ELECTROTHERM STEEL, JINDAL STEEL
74	STRUCTURAL ROLLED STEEL SECTIONS	TATA, SAIL, RINL

CHAPTER –B: ELECTRICAL WORKS

INDEX

- LIST OF IS: SPECIFICATIONS FOR ELECTRICAL INSTALLATION WORK
- BASIC ELECTRICAL REQUIREMENT
- LV SWITCHGEAR, POWER FACTOR CORRECTION AND ATS
- ELECTRICAL INSTALLATION AND WIRING DEVICES
- LUMINARIES

LIST OF IS: SPECIFICATIONS FOR ELECTRICAL INSTALLATION WORK

The following specifications will apply under all circumstances to the equipment to be supplied and installed against this contract. It is to be ensured that the contractor shall obtain for himself at his own expense and on his own responsibility all the information which may be necessary for the purpose of submitting the tender and for entering into a contract, keeping in view the specifications of installation and inspection of site etc.,

INDIAN STANDARD LT EQUIPMENT SPECIFICATIONS

1. LT Air circuit breakers	:	IS 2516 – Latest part I & II section–I, 8828/BS – 5311, 4752
2. Fuse switch units and switch Fuse units not exceeding 1000V AC or	:	IS 4064 Latest/ BS – 5419/IEC – 408 1200 V DV
3. Switch gear bus bar	:	IS 375 Latest
4. H R C fuse Links	:	IS 2208 Latest
5. Distribution Boards	:	IS 2675 Latest
6. Enclosures for low voltage switch gears	:	IS 2147
7. PVC cables (Heavy Duty)	:	IS 1554 Latest
8. PVC cables (Working Voltage up to And including 1100V)	:	IS 694 Latest
9. Tabular Fluorescent lamps	:	IS 2418 Latest
10. Tungsten filament lamps	:	IS 415 Latest
11. Ceiling fan	:	IS 374 Latest
12. Flood light	:	IS 1947 Latest
13. Industrial light	:	IS 1771 Latest

14. Water proof electrical fittings : IS 3553 Latest

15. Steel boxes for enclosure of : IS 5133 Latest

16. Electrical accessories

- ✓ Fittings for rigid steel conduit : IS 2667 Latest
- ✓ Mild steel conduit for Electrical Wiring : IS 653 Latest
- ✓ Accessories for rigid steel Conduit for electrical wiring : IS 3837 Latest
- ✓ Switch socket outlets : IS 4615 Latest
- ✓ Three pin plug & socket outlet : IS 1293 Latest
- ✓ Switches for domestic and similar Purposes : IS 3854 Latest
- ✓ Call bell and buzzers : IS 2268 Latest
- ✓ Earthing : IS 3043 Latest
- ✓ Electrical wiring installation : IS 732 Latest

17. Switch gear : IS 3072 Latest

18. Lightning protection : IS 2309 Latest

19. HT cable : IS 7098 Latest

20. Power transformer : IS 1886 Latest

21. Current Transformer : IS 2705 Latest

22. MCCB : IS 2516 part I & II/Sector I Latest

23. Relays : IS 3231 Latest

24. Indicating Instruments : IS 1248 Latest

25. Auxiliary contactors : IS 2959 Latest

26. Capacitors : IS 2834 Latest or

27. PVC/Metal conducting : IS 9357 Latest Part I,2,3 & 4

28. Bus-bar support insulators : IS 2544 Latest

29. Voltage Transformer : IS-3156/BS-394IIEC-44,186

30. Electrical relays : IS – 3231, 3842

31. Contactors for voltage not exceeding 1000V AC or 1200V DC control Switches: IS – 6875/BS – 4794/ IEC – 377

32. High Voltage fuse : IS – 9385/BS – 2692/ IEC – 269

33. Low Voltage fuse : IS – 1248/BS-89/IEC – 51

34. Indicating instruments A.C. Electricity Meters : IS-722, 8530/BS-5685/IEC-of induction type 45,211

35. Porcelain post insulators for system With nominal voltages greater than 1000 volts. : IS – 2544

36. Resistance wire, tapes and strips for Heating elements : IS – 3725

37. Wrought aluminium and aluminium Alloy bars, rods, tubes and sections For electrical purposes. : IS – 5082

38. Toggle switches : IS-3452/BS-3676

39. Metal enclosed switchgear and control Gear for voltage above 1000V, but not Exceeding 11000V : IS – 3427/BS-162

40. General requirement for switchgear And control gear for voltage not Exceeding 1000 volts : IS-4237/BS-5486/IEC-439

41. Degree of protection provided by Enclosures for low voltage switchgears And control gear : IS-2147/IEC-144

42. Dimensions for panel mounted Indicating and recording electrical Instrument : IS – 2419

43. Marking and arrangement for Switchgear, busbars, main connection And auxiliary wiring : IS – 375

44. Code of practice for selection Installations and maintenance of fuses : IS – 10118

I **Basic Electrical Requirements**

1.0 **General**

1.1 Scope

The scope of work covers complete electrical installation system for all buildings including but not limited to:

- ❖ Supply, storage, installation, testing and commissioning of all equipment, components, accessories, labour, tools and tackles required for the operation of the buildings to the extent specified and detailed on the drawings and specifications.
- ❖ All Civil works in connection with the Electrical Installation including supply, laying and fixing of necessary inserts, hooks, brackets and sleeves etc.
- ❖ Any work which can be reasonably inferred as necessary for the safe, satisfactory operation whether such work is specified or shown on the drawings or not.
- ❖ Arranging permanent supply including necessary submissions of drawings as required to the supply authorities and arranging inspections and obtaining necessary approvals of all the concerned authorities.
- ❖ At all crossing areas Fire sealant should be provided at both ends & the sealant should meet LEED requirement.
- ❖ The retaining wall crossing water proofing detail should be as per Civil specification
- ❖ Warning tape to be laid 300mm above UG cable during construction.

1.2 Licensed Electrical Contractor

All work shall be carried out by a licensed Electrical Contractor who is approved by the Consultant / Developer and who possesses a valid local Electrical Contractor's license employing licensed Supervisors and licensed Electricians, Helpers, as required. Required 3 years of documented experience at least.

1.3 Regulations and Standards

The installation shall conform in all respects to the Indian Standard Code of Practice for Electrical Wiring Installation IS.732-1963 and IS.2274-1963. It shall also conform with the current Indian Electricity Rules and the Regulations and requirements of the local Electric Supply Authority applicable to the *installation*. Wherever this specification calls for a higher standard of materials and/or workmanship than those required by any of the above Regulations, this Specification shall take precedence over the said Regulations and Standards.

In general, the materials, equipment and workmanship not covered by the above shall conform to the latest Indian Standards.

All bolts and nuts used shall be metric size with corrosion protection suitable for the location.

1.4 Documentation

The indication and/or description of and item on the drawings or in the Specifications, unless otherwise specifically stated, implies an instruction to supply and fix such items.

Notes on drawings referring to individual items of work generally take precedence over specifications, however all discrepancies shall be referred to the Consultant / Developer before ordering materials or commencing work.

Drawings show general run of cables, approximate locations of outlets and equipment, utility symbols and schematic diagrams of no dimensional significance. Refer to the Architectural drawings for locations and also obtain approval from the Consultant / Developer wherever dimensions are not shown, or locations cannot be determined from the drawings. Do not scale drawings to obtain locations.

All O&M documents have to be submitted in 5 sets of hard copy & 3 sets of Soft copy.

1.5 Design Criteria

Electrical materials and equipment shall comply in all respects, as a minimum to the latest Indian Standards Institution's recommendations.

Should any difference arise between ISI and the specification, the requirement of the Specification shall prevail.

The components of submain switchboards, distribution boards and other electrical equipment shall be clearly labeled in English.

Distribution boards shall have circuit schedules fastened to the inside cover of the board showing rating of the circuit breakers, type and number of points and their connected loads.

2.0 **Submissions**

2.1 Shop Drawings

Shop drawings shall be provided of the Main and Sub-Main Switchboards, Distribution Boards, Cable Trays, Reactive Power Compensation Panel, and any other switchboards and panels, wherever applicable and approval shall be obtained from the Consultant / Developer before commencing fabrication or procurement.

Any equipment or switchboard manufactured without the written consent of the Consultant / Developer prior to the approval drawings shall be liable for rejection.

All Floor drawings have to be submitted along with detail sections & elevations. Relevant drawing has to be submitted wherever necessary as insisted by consultant

As built drawings of all to be submitted in 5 sets & 3 Soft copies.

Shop drawing sizes & quantity preferred minimum A1 Size & 3 copies & after approval 6 copies have to be submitted.

All the material should be ordered after taking the approval for the qty & the necessary dwg from Client / Consultant.

3.0 **Foreman/Supervisor**

3.1 Qualifications

The Electrical Contractor shall employ a competent, licensed qualified full time electrical foreman/supervisor to direct the work of electrical installations in accordance with the Drawings and Specifications. **Required 5 years of documented experience at least.**

3.2 Responsibility

The foreman/supervisor shall be available at all times on the site to receive instructions from the Consultant / Developer in the day to day activities throughout the duration of the work.

The foreman/supervisor shall correlate the progress of the work in conjunction with all the relevant requirements of the Supply Authority. The skilled workers employed for the work shall have the requisite qualifications and shall possess competency certificates from the Electrical Inspectorate of Local Administration.

4.0 **Application for Power Supply, Fees, Permits and Tests**

4.1 Responsibility

The Contractor shall be responsible for filing and follow up of application for getting the drawings/scheme approved by the Electrical Inspector and finally the approval by the Electrical Inspector of the whole installation.

4.2 EB Supply to Site

The Contractor shall be responsible for negotiating with the EB for providing the required KVA electrical supply to the Project site.

4.3 Statutory Approvals

The Contractor shall be responsible for payment of all fees involved with obtaining Statutory Approvals. On completion of the work, the Contractor shall obtain and deliver to the Consultant / Developer the relevant final inspector, and approval certificates issued by the Local Electricity Supply Authority.
Also CEIG approval for other packages such as DG, HVAC, Fire, PHE, Lift, STP should be coordinated.

4.4 Tests

The Consultant / Developer shall have full powers to require the materials or works to be tested by an independent agency at the Contractor's expense in order to establish their soundness and adequacy.

The Contractor shall notify the Consultant / Developer at least 7 working days before testing of each system. The Consultant / Developer reserves the right to be present when such tests are being made.

If the Electrical Inspectorate requires manufacturer's test reports for HT cables, HT switch gear, transformers or any other equipment used in the project, the Contractor shall obtain such approvals at no extra cost to the Developer. Such approved reports shall be handed over to the Consultant / Developer.

Calibration certificates shall be obtained from the Meter and Relay Testing Department of the Electricity Board for all relays and meters used in the project at no extra cost to the Developer.

Identification of all equipment’s, DB’s, Switches & Sockets to be marked at site as well as in as built drawing & SLD to be paste at relevant location.

MEDIUM VOLTAGE CABLES

1.0 SCOPE

Design, Manufacture, Testing at Works, Inspection and delivery at site of 1.1kv XLPE/PVC Insulated with outer PVC protective Sheath power and steel wire armoured or steel tape armoured construction control cables in accordance with the latest revision of relevant India standard and Specification. The cables shall conform to IS 1554 Part I in all respects.

Cables shall be laid in tray/hume pipe/in ready-made trenches etc., as required.

2.0 STANDARDS

The cables covered by the specification shall, unless otherwise stated, be designed, manufactured and tested in accordance with the latest revision of relevant India standard.

IS 7098	: Cross Linked Polyethylene Insulated PVC (part II) Sheathed cables
IS 1554	: PVC insulated heavy duty cables for working voltage upto and including 1100kV.
IS 3975	: Mild Steel Wires, strips and tapes for armouring of cables.
IS: 8130	: Conductor for insulated electric cables and Flexible cords.
IS 5831	: PVC Insulation and Sheath of Electric Cables.
IS: 10418	: Specification for drums for electric cables.
IEC 540 & 540 A	: Test method for insulation and sheath of electric cables and cords .
IS: 10810	: Methods of tests for cables
IS: 10462	: Fictitious calculation method for determination of dimensions of protective coverings of cables.
IS: 10418	: Specification for drums for electric cables.

2.1 Rating

The cable shall be rated for a voltage of 1100 Volts.

Core Identifications
Cores shall be provided with the following colour scheme of PVC insulation:

1 core	:	Red/Black/Yellow/Blue
3 core	:	Red, Yellow and Blue
3 1/2 / 4 core	:	Red, Yellow, Blue & Black

3.0 CONDUCTOR

The conductor shall be Aluminium / Copper as specified.
The conductor shall be smooth, uniform in quality and free from scale and other defects.

The Aluminium conductor for 10Sq.mm and above (6Sq.mm for copper) shall be stranded and shall be clear and reasonably uniform in size and shape. The conductor shall be circular or sector shaped. The conductor for shall be stranded and shall be clear and reasonably uniform in size and shape. The conductor shall be circular or Sector Shaped.

The stranded conductor shall be compacted to reduce dimension and to give smoother profile.

4.0 CONDUCTOR SCREEN

The conductor screen shall be semi conducting compound and shall be extruded in the same operation as the Insulation.

5.0 INSULATION

Insulation shall be cross-linked polyethylene and shall be gas cured for XLPE.

Insulation shall be PVC for PVC cable as specified in schedule of quantities.

6.0 ARMOUR

Galvanized steel wire / strips armour shall be provided over the inner sheath for protection against mechanical damage.

The armour coverage shall be more than 95% to achieve better mechanical protection and low armour resistance.

7.0 OUTER SHEATH
All cable specified in schedule of quantity. The outer sheath shall be PVC and shall be resistant to termite and rodent attack.

Progressive sequential marking, size marking, voltage grade, manufacturer name at every one meter, shall be made on the outer sheath.

8.0 GENERAL
The cable shall withstand all mechanical and thermal stresses under steady state and transient operating conditions.

9.0 TEMPERATURE RISE
The maximum conductor temperature shall not exceed 90 degree C during continuous operation at full rated current. The temperature after short circuit for 1.0 second shall not exceed 250 degree C with initial conductor temperature of 90 degree C for XLPE cable. The temperature after short circuit for 1.0 second shall not exceed 160 degree C with initial conductor temperature 70 degree for PVC cable.

The Bidder shall give the following information for each conductor cross section specified.

a. Rated continuous current
b. Rated 1.0 second current.

Current Rating factor shall be given by the Contractor for the following:

i). Variation in ground temperature

ii). Variation in soil thermal resistivity
iii). Variation of Ambient temperature
iv). For the cables laid side by side, at ID spacing and in Tier formation.

The Bidder indicates the percentage overload that the cable can carry and its duration, when operating initially at a conductor temperature of 90 degree C, with final conductor temperature of 130 degree C.

10.0 CABLE DRUMS

Cables shall be supplied on non-returnable drums of sturdy construction as new in condition. All ferrous and other metal parts of drum shall be treated with a suitable rust preventive finish or coating to avoid rusting during transit or storage.

The length of cable on each drum shall be determined by manufacturer considering the transport limitations from manufacture's works to the site. The manufacturer will advice contractor of drum length before production.

The marking done on the drum shall have the following information:
a. Trade name, if any.
b. Name of the manufacturer.
c. Number of cores and nominal area of the conductor.
d. Type of the cable and voltage for which it is suitable.
e. Length of the cable on the drum.
f. Direction of rotation of drum (an arrow).

The outer ends of the cables shall be sealed by means of non-hygroscopic sealing materials.

11.0 CABLE JOINTING

Cable jointing strictly not allowed

Required length of the cable to be estimated by the Vendor and order for the same.

11.1 Cable Terminations

Each termination shall be carried out using brass compression glands and cable sockets. Hydraulic crimping tool shall be used for making the end terminations. Cable gland shall be bonded to the earth by suing suitable size G.I. wire/tape.

Suitable identification tags with the feeder designation inscribed on an aluminium/G.I. sheet shall be tied to either ends of each cable

11.2 Laying

Cables shall be laid as per the specifications given below:

11.3 Cable on Trays/Racks

Cables shall be laid on cable trays/racks wherever specified. Cable racks/trays shall be of perforated steel section slotted angles for suitable purpose. The trays/racks shall be complete with plates, tees, elbows, risers and all necessary hardware. The steel trays shall be painted. Cable trays shall be erected properly to present a neat and clean appearance. Suitable cleats or saddles shall be used for securing the cables to the cable trays. The cable trays shall comply with the following requirements:

a) The trays are ladder type and shall have suitable strength and rigidity to provide adequate support for all contained cables.

b) It shall not present sharp edges, burrs of projections injurious to the insulation of the wiring/cables.

c) If made of Sheet metal, it shall be adequately strength protected against corrosion or shall be made of corrosion resistant material.

d) It shall have side rails or equivalent structural members.

e) It shall include fittings such as horizontal, vertical bends, tie rods, hooks etc., or other suitable means for changes in direction and elevation of runs, fishplates and hard ware.

f) All outdoor / Terrace exposed metal parts including accessories should be hot dip GI/ any rust proof should be specified.

11.4 Installation

a) Cable trays shall be installed as a complete system. Trays shall be supported properly from the building structure. The entire cable tray system shall be rigid.

b) Each run of the cable tray shall be completed before the installation of cables.

c) In-portions where additional protection is required, non-combustible covers/enclosure shall be used.

d) Cable trays shall be exposed and accessible.

e) Where cables of different system are installed on the same cable tray, non-combustible solid barriers shall be used for segregating the cables.

f) Cable trays shall be grounded by two nos. earth continuity wires. Cable trays shall not be used as equipment grounding conductors.

11.5 Type Test

The bidder shall furnish two copies of type test certificates conducted on similar Cables.

a) partial discharge test
b) Bending test followed by partial discharge test.
c) Dielectric power factor as functional voltage.
d) Dielectric power factor as a function off temperature.
e) Heating cycle test followed by dielectric power factor as of voltage and partial discharge tests.
f) High voltage test

12.0 ROUTINE TESTS (To be performed on each drum length)
These shall include, among others normally performed by the manufacturer, the following:

a. Conductor D.C. resistance test
b. Capacitance
c. Partial discharge level measurement at Power frequency
d. High voltage test

12.1 TESTING OF CABLES

Insulation between Phases and, between Phase & 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 BRBNMPL.

In addition to the standard visual and routine tests, the following tests shall be carried out on the High Voltage system in accordance with the relevant IS:

a. Insulation Resistance Test Number 1: Before the high voltage test is performed, the insulation resistance of the complete installation shall be measured to ensure that the high voltage test may be safely applied.

b. High Voltage Test: A high voltage test shall be applied between each phase conductor and earth, at a DC voltage which shall be slowly increased to not less than 15000 V and maintained for not less than one minute. There shall be no indication of failure or incipient breakdown during the test.

c. Insulation Resistance Test Number 2: The insulation resistance test shall be repeated. The insulation resistance shall not be significantly less than the value of insulation resistance measure previously.

d. Earthing Resistance Test: The earthing resistance shall be measured and shall not exceed 30 Ohms.

All tests shall be carried out in accordance with relevant Indian Standard Code of Practice (BIS CP) 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 test equipment used for the tests shall bear a calibration seal not more than six months old.

Minimum permissible Bending radius: The cable should not be bent to a sharp radius minimum recommended bending radii are given below:

Single core	Multi core	Voltage in kV
15 D	12 D	above 1.1 to 11

Clearances

Power cable to control cable	:	0.2 meter
Power cable to communication cable	:	0.3 meter
Power cable to gas / water mains	:	0.3 meter

Cable laid across the roads, railway tracks and water pipe lines:

Materials to be used for Pipes: Steel cast iron, cement or earth ware ducts are cable ducting blocks. The diameter of the cable conduit should be at least 1.5 times the outer diameter of the cable. The ducts / pipes should be mechanically strong to with stand force due to heavy traffic when they are laid across the road / railway tracks.

12.2 Testing of cables installation

Measurements
Insulation resistances
Conductor resistances (DC)
Capacitances
High voltage test

13.0 CABLE INSTALLATION NOTES

1.1 These notes in general apply to installation of cables.

1.2 Electrical installation work shall comply with all currently applicable statutes, regulation and safety codes in the locality / country where the installation is to be carried out.

1.3 Installation of cables shall be carried out generally as per IS: 1255 or relevant applicable standards of any other country specified in the specification and as per the instructions contained in specification, enclosed standard drawings and relevant project drawings.

1.4 Installation of cables includes storing, laying, fixing, jointing, termination, and all other work necessary for completing the job. Supply of glands and lugs, together with other necessary materials for joining and termination shall also be included in the Contractor's scope.

1.5 Construction of cable trenches, provision of embedment and similar work involving civil items shall be coordinated with Civil Contractor by Electrical Contractor. However when such work is required to be done by the Electrical Contractor, it shall be carried out as per the instruction / notes on the relevant project drawings and installation specification of the project.

1.6 Cables shall be installed in trenches, trays, racks, tunnels, conduits, and ducts or directly buried. The actual cable layouts shall be shown on the relevant project drawings. Changes if necessary, after obtaining prior approval of the Employer shall be carried out at site by the Contractor and shall be clearly indicated in "As Built Drawings" by him and forwarded to the Employer

1.7 Cables to each circuit to be laid in one continuous length. Cable joining if Necessary shall be done only after obtaining prior permission from Employer

14.0 OUTDOOR CABLE INSTALLATION

1.1 Directly buried cables shall be laid as per drawings and cable markers shall be provided. At least one cable marker shall be provided if the length of the buried cable is less than 15 meters. Buried single core cable laid in trefoil formation shall be tied by plastic tapes or 3mm dia. Nylon cord every 750mm.

1.2 Joints in directly buried cable shall be identified by joint markers at each joint location. For details of joint markers refer drawings.

1.3 In each outdoor cable run greater than 60 meters, some extra length of cable shall be kept at a suitable point to enable a straight through joint to be made, should the cable develop fault at a later date.

1.4 Where cable cross roads and water / oil / gas / sewage pipes, the cable shall be laid in Hume or pipes. For road crossing the pipe for the cable shall be buried at not less than 600mm depth unless otherwise noted in the drawings. Hume pipe shall be preferred to steel pipe from the point of view of corrosion.

1.5 Control cables and small power cables in trenches, tunnels and racks shall be run in ladder type cable trays (Maximum tray width 600mm) supported on trench/ tunnel/ rack carrier arms. The cables shall be tied to tray rungs by means of 3mm dia. Nylon cord at an interval not exceeding 3000mm and also at bends.

1.6 For good sealing arrangements at entry points, suitable pipe sleeves, adequate in number and adequate in sizes shall be provided in building walls / slabs for passage of cables into building from cable trays/ racks/ cable trenches located outside the buildings. Details of sleeves and exact location of such entry points will be available on relevant project drawings.

15.0 CABLES IN TRAYS / ON RACKS

1.1 Different voltage grade cables shall be laid in separate trays when trays are arranged in tiers. HV cables shall be laid in top trays and cables of subsequent voltage grade in lower tier of trays.

1.2 1100V grade power cables of 120 sqmm size and above shall normally be laid in single layer in trays or on racks. In exceptional cases, these may be laid in double layer, if shown on the drawings or with the permission of the Employer

1.3 Control and instrumentation cables can be laid upto maximum of three layers in each tray / Rack.

1.4 Single core power cable of 3 phase AC circuits laid in trays/ racks/ trenches in trefoil group shall be held in trefoil clamps placed at an interval not exceeding 3 meters. The trefoil group of cable additionally be tied by means of 3mm dia. Nylon cord as follows.

a) At an interval not exceeding 1 meter when laid in cable tray / Racks.
b) At an interval not exceeding 750mm when laid in trenches without cable trays.

1.5 Cables in vertical raceways shall be clamped by saddle type cleats / cable binders to the horizontal slotted angles. Cleats shall be fabricated from 3mm aluminium strip at site by Electrical Contractor to suit the cable groups. Single core cables shall be clamped with trefoil clamps.

16.0 BENDING RADIUS FOR CABLES.

16.1 The bending radius for various types of cables shall not be less than those specified below, unless specifically approved by the manufacturer.

Type and voltage grade of the cable.	Minimum Bending Radius	
	Single core	Multicore
a) Paper insulated upto 1.1KV	20 D	15 D

b) Paper insulated above 1.1KV and upto 11KV	20 D	15 D
c) Paper insulated above 11KV	25 D	20 D
d) PVC & XLPE insulated upto 1.1KV	15 D	12 D
e) PVC & XLPE insulated above 1.1KV and upto 11KV	15 D	15 D
f) PVC & XLPE insulated above 1.1KV	20 D	15 D

Where "D" is the overall diameter of the cable.
(For other types of cables, recommendation of manufacturers shall be followed.)

16.2 The values may be reduced to the extent of 70% when making only one bend such as in case of installing the termination.

17.0 TERMINATIONS, CLAMPING & MISCELLANEOUS DETAILS

17.1 Cable entry to the motors, Push button stations and other electrical devices shall be from the bottom as far as possible or from the sides. Top entry shall be avoided particularly for outdoor equipment.

17.2 Identification tags made from aluminium sheet shall be attached to each end of the each cable by means of GI binding wire. Tags shall be additionally put at an interval of 30 meters on long runs of cable and in pull boxes.

17.3 All cable terminations shall be solder less crimping type. Whenever lugs are to be supplied, adequate size crimping lugs for approved make shall be used by the contractor. The crimping tools shall be adequate for the size of the lug

17.4 Saddle type clamps to suit number of cables to be clamped at a particular location shall be used for clamping cables running along the walls, ceilings, structures etc. The interval between adjacent clamps shall be shown on the relevant enclosed drawings

17.5 Wooden cleats when required for supporting vertical runs of one or more single core cables per phase, such as near transformer cable boxes, shall be made of well seasoned wood and shall be painted with two coats of fire retardant paint of approved quality

18.0 TESTING AND COMMISSIONING OF CABLES

Cables shall be checked for insulation resistance before Laying and after laying and termination/ jointing of the cable. The voltage rating of the megger for cables of different voltage grade as indicated below.

Voltage Grade of cable	Megger Rating
1.1 KV	500V
11 KV	1000V

19.0 High voltage Testing

19.1 All cables of 33/11KV grade 400sqmm HV cables shall be subjected to DC or AC high voltage test after jointing and terminating but before commissioning as per relevant standards. Testing with DC voltages should be preferred as test equipment required is compact, easily portable and requires low power. The DC test voltages applicable in India in accordance with IS:1255. The cable cores must be discharged on completion of DC high voltage test and cable shall be kept earthed until it is put into services

19.2 DC test voltages for the old cables shall be 1.5 times rated voltage or less depending upon the age of the cable, repair work or nature of jointing work carried out.

19.3 In each test, Metallic sheath/ screen/ armour shall be connected to earth.

19.4 Continuity of all the cores, correctness of all connections as per wiring diagrams, correctness of polarity and phasing of power cables and proper earth connection of cable glands, cable boxes, armour and metallic sheath shall be checked.

LOW VOLTAGE SWITCHGEAR

1.0 SCOPE

This Specification covers the design, material selection, constructional features, manufacture, inspection and testing at the manufacturer's works, packing, transportation, delivery, testing and commissioning of the following:

1.1 SITE CONDITIONS

1.1.1	Temperature	:	Maximum 40 Deg. C Minimum 10 Deg. C
1.1.2	Humidity	:	Not more than 28% at maximum temperature.
1.1.3	Rainfall	:	800 – 1500mm per Annum.

1.2 The Switch gear Bus Bar, Construction and Breaker Details for switchboards as Follows

1.2.1	SWITCHGEAR AND BUSBAR RATING		
1.2.1.1	Switchgear Designation	:	Refer SLD
1.2.1.2	Rated voltage, phases & frequency	:	433V, 3 PH, 4 Wire, 50 Hz
1.2.1.3	System neutral earthing	:	Effectively earthed
1.2.1.4	Maximum system voltage	:	433V + 10%
1.2.1.5	One minute power frequency voltage		
	a) Power circuits	:	2500V
	b) Control circuits	:	1500V
	c) Aux. Circuits connected to sec. of CTs & VTs	:	2000V
1.2.1.6	Reference ambient temperature	:	40^{o}C
1.2.1.7	Maximum temperature of busbars, droppers and contacts at continuous	:	90 ^{o}C

	current rating under site reference ambient temperature		
1.2.1.8	Short circuit withstand for busbars and droppers		
	a). Short time (1 sec.) at 433V, kA(rms)	:	Refer SLD
1.2.2.	SWITCHGEAR CONSTRUCTIONAL REQUIREMENTS		
1.2.2.1	Thickness of sheet steel		
	Cold Rolled	:	Frame, 2.0 Doors 1.6 covers 1.6
	Hot Rolled	:	Frame, 2.5 Doors 2.0 covers 2.0
1.2.2.2	Degree of protection as per IS: 13947 (PART 1)	:	IP-52 for INDOOR/IP-65 for outdoor.
1.2.2.3	Bus bar material	:	Al - grade 19501
1.2.2.4	Earthing bus Material	:	GS
	Size	:	50 x 10mm.
1.2.2.5	Clearances in air of live parts		
	Phase to phase	:	25.0mm
	Phase to earth	:	19.0 mm
1.2.2.6	Painting	:	Light Grey shade RAL 7035
1.2.3	BREAKERS		
1.2.3.1	Circuit breaker type	:	ACB / MCCB / MCB (As per enclosed 433V Single Line Diagram)
1.2.3.2	Voltage frequency & no. of phases	:	433V, 50 Hz, 3 Ph
1.2.3.3	Rated operating duty	:	O-3 min - CO – 3 Min – CO
1.2.3.4	Rated breaking capacity		
	a). kA(rms) at 433V, 0.25 P.F.	:	Refer SLD
1.2.3.5	Short circuit withstand current for 1 sec. Duration	:	Refer SLD
1.2.3.6	Type of operating mechanism	:	Motor wound spring charged
1.2.3.7	Shunt trip required	:	Yes
1.2.3.8	Protection required		
	a) Relays/series releases	:	Relays
	b) Under voltage release required	:	No
1.2.3.9	Minimum no. of additional auxiliary contacts (for purchaser's use)	:	6 NO + 6 NC
1.2.3.10	Control voltage		
	a) For spring charging motor	:	240V AC
	b) For closing/tripping	:	30V DC
1.2.3.11	Emergency manual operation required in addition to electrical operating devices		
	a) For spring charging & closing	:	Yes
	b) For tripping	:	Yes

2.0 APPLICABLE STANDARDS - 433V AC SWITCHGEAR

Standards mentioned below are only guidelines. The equipments and works shall be carried out as per the latest standards.

1.	Switchgear General Requirements	IS 4237	IEC 947
2.	AC Circuit Breakers	IS 13118	IEC 56
3.	Factory built assemblies of switchgear and control gear for voltages upto and including 1000V AC and 1200V DC	IS 8623	IEC 439
4.	Air break switches	IS 13947(Part 3)	IEC 947-3
5.	Miniature circuit breakers	IS 8828	IEC 898
6.	HRC cartridge fuses	IS 9224	IEC-269
7.	D Type fuses	IS 8187	
8.	Contactors	IS 13947(Part 4)	IEC 947
9.	Starters	IS 13947(Part 4)	IEC 947
10.	Control switches / push buttons	IS 6875	
11.	Current transformers	IS 2705	IEC 44-1
12.	Voltage transformers	IS 3156	IEC 186
13.	Relays	IS 3231	IEC 255
14.	Indicating instruments	IS 1248	IEC 51
15.	Arrangement for busbars main connections and accessories	IS 11353 / IS 5578	
16.	AC electricity meters	IS 722	
17.	Degree of protection	IS 13947(Part 1)	IEC 947-1
18.	Code of practice for installation and maintenance of switchgear	IS 10118	-
19.	Code of practice for Phosphating iron and steel	IS 6005	
20.	Wrought aluminium & aluminium alloys for electrical purposes	IS 5082	IEC 114
21.	Control transformer for switchgear and control gear for voltage not exceeding 1000V AC	IS 12021	IEC947
	NOTES Equipment, accessories, component parts, raw materials and tests shall in general conform to.	□ IS	□ IEC

3.0 DESIGN AND PERFORMANCE REQUIREMENT

3.1 All the 433V AC, devices/equipment like bus support insulators, circuit breakers, VTs, etc., mounted inside the switchgear shall be suitable for continuous operation and satisfactory performance under the following supply conditions:

i) Variation in supply voltage : ± 10%
ii) Variation in supply frequency : ± 5%
iii) Combined voltage and frequency Variation : 10%

3.2 The breaker ratings indicated refer to the nominal rating of the breaker. However breaker shall be capable of carrying continuously at least 120% of circuit current at an ambient temperature of 40 deg.C and with breaker mounted inside the panel. If a higher rated breaker is necessary to meet this, the same shall be offered.

4.0 CONSTRUCTIONAL FEATURES

4.1 Switchgear shall be

a) Of the metal enclosed, indoor / outdoor floor mounted modular type

b) Made up of the requisite vertical sections

c) Of dust and vermin proof construction with degree of protection.

d) Easily extendable on both sides by the addition of vertical sections after removing the end covers

e) Provided with a metal sill frame made of structural steel channel section properly drilled for mounting the Switchgear along with necessary mounting hardware. Hardware shall be zinc plated and passivated

f) Provided with cable entry facilities at top/bottom as per layout requirement with 3mm thick removable gland plates on breaker panels and 2 mm thick removable gland plates on other panels with necessary cable glands. For 1 core cables, these plates shall be non-magnetic

g) Of uniform height of not more than 2375mm

h) Provided with gaskets all round the perimeter of adjacent panels, panel and base frame, removable covers and doors

j) Provided with busbars running at the top or bottom, as required, all along the length of the switchgear in a separate sheet steel enclosure.

4.1 Apparatus forming part of the Switch boards shall have the following minimum clearances:

i. Between phases - 25mm
ii. Between phases & neutral - 25mm
iii. Between phases & earth - 25mm
iv. Between neutral & earth - 19mm

When, for any reason, the clearance is not available, suitable insulation barrier shall be provided. Clearances shall be maintained during normal service conditions. Creep age distances shall comply to those specified in relevant standards.

All insulating material used in the construction of the equipment shall be non-hygroscopic material treated to withstand the effects of high humidity, high temperature and tropical ambient service conditions.

Functional units such as circuit breakers, fuse switches, MCCBs, etc., shall not be arranged in multi-tier formation except that nor more than two ACBs shall be housed a single vertical section.

Metallic / insulated barriers shall be provided within vertical sections and between adjacent sections to reduce damage due to arcing fault and prevention of accidental contact with:
Main bus-bars and vertical risers during operation, inspection or maintenance of functional units and front mounted accessories.

Cable termination of one functional unit, when working on those of adjacent unit/ units.

All covers providing access to live power equipment / circuit shall be provided with tool operated fasteners to prevent unauthorized access. One such tool shall be supplied along with each panel.

Provision shall be made for permanently earthing the frames and other metal parts of the switchgear by independent connection. All the doors shall be provided with braided flexible copper earth connection.

Doors with cutouts for instruments / relays shall be provided with stiffeners to avoid buckling

Only CRCA steel sheet shall be used for fabricating the cubicle.

Thickness tolerance for sheets shall be as applicable in the relevant IS

5.0 433V SWITCHGEAR

5.1 Main and Auxiliary Buses

5.1.1 Main Buses & Taps

The busbars shall be made of aluminium alloy of E91 grade. All bus bars, bus taps shall be insulated with heat shrinkable PVC to provide a permanent high dielectric non-ageing and non-tracking protection; impervious to water, tropical conditions and fungi.

The insulation shall be non-inflammable and self-extinguishing and in fast colours to indicate phases. The joints shall be insulated in such a way as to provide for accessibility of contact bolts for maintenance. Joints shall be covered with removable moulded shrouds made out of fibreglass-reinforced polyester.

5.1.2 Auxiliary Buses

Auxiliary buses for control power supply and space heater power supply buses shall be insulated, and adequately sized to suit requirements. The material for control supply buses shall be electrolytic copper and for space heater power supply shall be same as that for power buses.

5.2 BUS BAR ZONE

5.2.1 The zone comprised of horizontal bus bar, vertical bus bars, heat shrunk PVC sleeves, SMC Insulated supporting system.

5.2.2 The busbars chambers shall be suitable for 500V, 3phase 4 wires, 50Hz, the short Circuit level as specified in BOQ

1. Rated current, voltage and frequency
2. Withstand capability during short circuit condition
3. Protection against vermin, falling tools, hardware which tend to bridge and initiate arcing faults.
4. Protection against and conducting deposits which accelerates tracking on supporting surface and consequently cause failure of the supporting system.
5. Proper ventilation for heat dissipation.
6. The orientation and spacing between the bus bars to withstand short circuit.
7. Temperature rise and derating factor.
8. Arcing faults.
9. Insulation levels.
10. Proximity effects.

The bus bar shall be either tinned copper or aluminum as specified in the BOQ.

The conductivity of aluminum or copper bus bars should high and electrolytic grade copper of 99.9% IACS and aluminium of 55% IACS (International annealed copper standard) confirming to IS 5082 – 1981, aluminium grade 63401 – WP .

The busbar shall be provided with black color heat shrunk PVC sleeves along the entire length, but the joints shall be shrouded.

When bus bar / links are connected in parallel some gap should be maintained between the buses of same potential to improve heat dissipation. The gap should be equal to the thickness of the bus of 10mm whichever is higher.

Stiffeners shall be provided between bus of same potential to avoid bending stress on conductors and number of such stiffeners shall depend on the partial force.

The total stress under short circuit condition should not exceed 0.1% proof stress of the bus bar material.

The insulation material used for the supports should have following desirable properties.

- High mechanical strength.
- High Di-electric strength
- High temperature withstand.
- Non flammable properties.
- Non hygroscopic properties.
- High comparative tracking index.

When marking busbar joints the safe minimum bending radius shall be T for copper busbars and 2T for aluminium busbars where the T is the thickness of the busbars.
The busbar section shall be joint either by the overlapping or by providing fish plates and bolt or clamping the sections together. Bolting and claming methods should provide joints that have satisfactory service life.

The main requirement for any busbar joints is that electrical efficiency should remain stable under all conditions of service. To achieve this, the following factors to be taken in to account when the joint is made. They are

1. Proper contact pressure must be applied and maintained.
2. The surface of the aluminium must be cleaned before bolting up.
3. Air and moisture must be excluded from the joints.
4. The overlap should be at least equal to the width of the busbars.

The busbars shall be suitably supported with DMC / SMC supports designed to provide a fault withstands capacity as specified.

High tensile bolts and spring washers shall be provided at all bus bar joints.

Busbars shall be designed for rated normal continuous current; and fault level for one Second. Busbars shall be rated in accordance with the service conditions and the rated continuous and short time current ratings specified in annexure and BOM. Maximum temperature of the main busbars and busbar connections, under operating conditions, when carrying rated normal current at rated

frequency shall not exceed 45 Deg above ambient . Busbar temperature limits shall be adhered to without forced cooling method.

The neutral busbar shall have continuous ratings of at least 50% of the phase busbars as specified, for non linear loads the neutral bus bar shall rated 200% of the phase busbar rating.

All busbar joints and bus tap joints shall be preferably be silver faced. In case of aluminum busbars with bare joints, suitable neutral grease shall be applied to the meeting surfaces after finishing the surfaces to prevent oxide formation. For joints to be made at site, sufficient quantity of grease shall be supplied by the VENDOR in suitable containers.

An earth bus shall be rated for fault current for 1sec and the size shall not be less than 32 x 6 mm aluminium and 25x3 copper. The earth Bus bar shall run throughout the length of the switch board at top or bottom as required.

Space Heater

Each Vertical section shall be provided with thermostat controlled space heater. Shall have individual switch.

6.0 CIRCUIT BREAKERS

6.1 Circuit breakers shall be

- Of the Air-Break drawout type, mounted along with its operating mechanism on a wheeled carriage moving on guides, designed to align correctly and allow easy movements.

- Of the shunt trip type.

- Provided with an operating mechanism

- Provided with mechanically operated targets to show ‘open’, ‘closed’, ‘service’ and ‘test’ positions of the circuit breaker.

- Provided with mechanically operated, red ‘trip’ push button, shrouded to prevent accidental operation.

- Provided with locking facilities in the ‘service’, ‘test’, and ‘isolated’, positions. In test position the breaker will be tested without energising the power circuits. The breaker shall remain fully housed inside the compartment in the test position.

- Provided with 6 NO and 6 NC potential free auxiliary contacts, rated 6A at 240V AC and 1A inductive breaking at 220V AC.

- Provided with ‘red’, ‘green’ and ‘amber’ indicating lamps to indicate ‘closed’ ‘open’ and ‘auto-trip’ conditions of the circuit breaker when breaker operation is controlled by a control switch.

- All indicating lamps shall be clustered LED type, with in-built short circuit, surge protections etc.

- Adequate number of contacts shall be provided to have remote annunciation of the breaker feeders:

i) Breaker 'ON'
ii) Breaker 'OFF'
iii) Breaker 'TRIP'
iv) Breaker 'Service'
v) Breaker 'Test'

Circuit breaker rating shall be selected to suit the site conditions mentioned in this document.

6.2 Operating Mechanism

Circuit breakers shall be provided with power operated mechanism of the motor wound spring charging stored energy type with provision for emergency manual charging facility

- Closing of circuit breaker shall automatically initiate recharging of springs and the motor shall be automatically decoupled when the emergency manual charging handle is coupled

- The mechanism shall make one complete closing operation once the switch is operated, even though the control switch is released before the closing operation is complete, provided that there is no counter trips impulse

- An electrical anti-pumping relay shall be provided in addition to mechanical anti-pumping feature.

- The breaker closing and trip coils will be suitable for 30 V DC

6.3 Circuit breakers shall be provided with all necessary interlocks including the following interlocks:

- It shall not be possible to plug-in a closed circuit breaker, or to drawout a circuit breaker in the closed position.

- It shall not be possible to operate a circuit breaker unless it is in the fully plugged-in, test, or fully isolated position.

- Interlocking arrangement shall be such that, the incomer breaker is to be tripped in case of tripping of upstream breaker (Transformer Primary side).

6.4 Closing and trip coil shall operate satisfactorily under the following conditions of supply voltage variation:

- Closing coils - 85% to 110% of rated voltage.

- Trip coils - 70% to 110% of rated voltage.

7.0 MCCBs

7.1 The MCCBs shall conform to the latest applicable standards (IS: 13947)

7.2 MCCBs in AC circuits shall be of TP/TPN/FP construction arranged for simultaneous manual closing and opening. Operating mechanism shall be quick-make, quick-break and trip-free type. The ON, OFF and TRIP positions of the MCCB shall be clearly indicated and visible to the operator. Operating handle for operating MCCBs from door of board shall be provided.

7.3 The instantaneous short circuit release shall be so chosen by the CONTRACTOR as to operate at a current in excess of the peak motor inrush current and a range of settings shall be provided for the EMPLOYER 'S / ENGINEER'S selection.

7.4 MCCB terminals shall be shrouded and designed to receive cable lugs for cable size relevant to circuit ratings.

7.5 MCCBs shall incorporate time delay devices to ensure that it will tolerate harmless transient overload unless this is well in excess of 25% of its rated value for a sustained period.

8.0 MCBs

Miniature circuit breakers for use on motor space heater control circuits shall comply with the requirements of applicable standards, unless otherwise mentioned in Data Sheet.

9.0 Contactors

- Motor starter contactor shall be of the electromagnetic type rated for uninterrupted duty as defined in applicable standards.

- Main contacts of motor-starter contactors shall be of silver plated copper.

- Contactors shall be of the double break, non-gravity type.

10.0 Direct-on-Line Starters/Star Delta Starters

Starters shall be suitable for Class AC 3 utilization category as specified in applicable standards.

11.0 Thermal Overload Relays

Starters shall be complete with a three element, positive acting, ambient temperature compensated, time lagged thermal overload relay with adjustable settings. The setting range shall be properly selected in accordance with the rating of the motor.

Relay Coordination chart should be provided from Panel builder upto the last point.

12.0 Switch and Contactor Ratings

Switch and contactor ratings for various motor starter modules shall be selected based on the motor rating during the detailed engineering. Bidder shall select appropriate ratings for HRC fuses and ranges for thermal overload relays and indicate the same in the bid.

13.0 Refer single line diagram for the required MCCs with the starters and starter panels.

14.0 SWITCHGEAR AUXILIARIES

14.1 Adequately rated single phase, two winding, dry type transformers shall be included for providing supply to the switchgear control and alarm circuits, space heaters provided in the switchgear.

14.2 All interpanel wiring required shall be included in the scope.

15.0 INSTRUMENT TRANSFORMERS

Instrument transformer as called for in the SLD shall be provided for all switchgear / Panels.

15.1 Current Transformers

Current transformers shall be of dry type with short time current rating equal to that of the associated switchgear for 1.0 sec. for breaker feeders. For feeders with fuse, CTs shall have withstood capacity equal to the through current of associated fuse.

15.2 Voltage Transformers

Voltage transformers shall be of dry type and shall have continuous over voltage factor of 1.2 and short time over voltage factor of 1.5 for 30 seconds for effectively earthed system

16.0 INSTRUMENTS & RELAYS

16.1 Indicating instruments

16.1.1 All electrical indicating instruments will be 96 mm square, with 240 degree scale (Taut band type). They shall be suitable for semi-flush with only flanges projecting on vertical panels.

16.1.2 Instruments shall have accuracy class of 1.0 or better. The design of the scales shall be such that it can read to a resolution corresponding to 50% of the accuracy class index. Trivector Meter / Energy Monitors / KWH meter mentioned in the SLDs shall have pulse output to be integrated with the BAS system and an accuracy class of 0.5.

16.2 Protective relays

16.2.1 Protective relays shall conform to standard requirements. Type of relays either static or electro-mechanical which meet the various performance requirements are considered acceptable.

16.2.2 All static relays shall be adequately protected against external voltage surges and noise signals. In addition to this, all the input circuit of static relays will include their own auxiliary current and voltage transformers with screened windings. Where auxiliary interposing transformers are not feasible in the input circuit, relays would have special surge suppression circuits to suppress external noise and surges.

16.2.3 Output elements of all static relays shall consist of electro-mechanical relays only.

16.2.4 Relays shall have at least the following electrically independent output contacts for the following purposes:

a) Tripping circuit
b) Remote / local annunciation

If the main relay does not have sufficient number of output contacts inherently, these shall be multiplied using auxiliary relays. These auxiliary relays shall be used for

annunciation, indication, etc. only. For tripping, only the contact of main relay shall be used directly.

17.0 TRANSIENT VOLTAGE SURGE SUPPRESSOR

17.1 General

TVSS shall be as per IEEE standards & UL listed. The current rating of TVSS for different Panels shall be as specified below.

- TVSS shall be mounted in a separate chamber away from control components. The cable length between bus & TVSS shall be less as much as possible.
- Irrespective of TVSS rating a minimum of 10Sq.mm copper wire shall be used.

17.2 General Constructional Features & Standards

The TVSS shall provide protection from power surges & transients for DB's, MCC & PCC's, ANSI /IEEE C62.41 Category A,B & C3 Compatible.

TVSS should be MOV based with each circuitry packaged inside a multi cavity, glass filled plastic housing rated UL94-5 V. The assembly should be packed with specially formulated sand & then epoxy capsulated.
Tested in accordance with ANSI /IEEE C62.11 C62.45 tested.

UL 1449 (2nd edition), UL1283 & CSA listed.

The module used in the TVSS should be UL at 600V AC and 300,000AIC.

Each MOV inside the module to be individually fused & matched to within 1% toensure max. sharing & full surge current handling capacity.

Sine Wave Tracking EMI & RFI filtering.
5 year warranty against defects in materials & workmanship.

17.3 General Specifications

Connection Means	:	Parallel connection (10 sq.mm)
Agency Listed	:	UL1449(2nd edition), UL1283, CSA
Protection Modes	:	All Modes Standard (L-N,L-G,N-G,L-L)
EMI/RFI Attenuation	:	50db typical from 10khz to 100 Mhz.
Response Time	:	Less than 0.5ns
Enclosure	:	Gray Noryl HS-1000, rated 94-5V,NEMA 12,4, or 4x
Fault Current Rating	:	300,000AIC @ 600VAC
Operating Frequency	:	47 to 63 HZ.
Line Voltage	:	+/- 15% Nominal
Operating Temp	:	-40 to 60 deg. Centigrade.
Storage Temp.	:	-55 to 85 deg. Centigrade.
Audible Noise	:	Less than 45 dBa.

RMS SYSTEM AMPS	SURGE CAPACITY PER MODE OF PROTECTION	PROTECTION MODES	REQUIRED MINIMUM FAULT BREAKING CURRENTCAPACITY
3000 ABOVE	200KA	L-N, L-E, N-E	200KA
2000-3000	200KA	L-N, L-E, N-E	200KA
1000-2000	80 -- 100KA	L-N, L-E, N-E	80KA
400-1000	80KA	L-N, L-E, N-E	80KA
225-400	40KA	L-N, L-E, N-E	40KA
100-225	40KA	L-N, L-E, N-E	40KA
30 - 100	40KA	L-N, N-E	40KA

18.0 WIRING AND ACCESSORIES

18.1 Cubicles shall be completely wired upto equipment / terminal block. Interpanel and inter-cubicle looping of control and cubicle space heating supplies to be carried out by Contractor. Wiring to be carried out with 650V grade single core PVC insulated stranded copper conductor of following sizes:

a) All circuits except CT circuit : 1.5 sq.mm.
b) CT circuit : 2.5 sq.mm.

18.2 Longitudinal troughs extending throughout the full length of the panels to be provided for interpanel wiring, AC-DC supplies, PT circuits, annunciator circuits, etc. Ferrules for wire termination to be provided. Wire connected to trip circuit will have red coloured ferrule.

19.0 TERMINAL BLOCKS

19.1 Terminals blocks for CT and PT secondary leads shall be provided with test links and isolating facilities.

19.2 All spare contacts and terminals of the panel mounted equipment and devices shall be wired to terminal blocks. At least 10% spare terminals shall be provided.

19.3 Terminal blocks to be suitable for connecting the following conductors of the PURCHASER's cables on each side:

(a) All circuits except CT circuit Minimum of two 1.5 mm^2 copper
(b) CT Circuits Minimum of four 2.5 mm^2 copper

20.0 CABLE TERMINATIONS

20.1 Power and control cable glands and crimping type lugs shall be supplied to suit the cable sizes.

20.2 Glands shall be heavy duty, double compression type made of brass and plated.

21.0 TESTS TO BE CONDUCTED

21.1 Functional test, temperature rise test, high voltage test, limits of operation test, insulation test. PURCHASER will have the option to witness the tests at the MANUFACTURER'S work before despatch.

21.2 TENDERER shall furnish the type test certificates along with the Tender. In the absence of the same, the CONTRACTOR shall arrange to carry out the type test without any cost implication to the EMPLOYER.

22.0 DATA TO BE FURNISHED BY THE VENDOR

22.1 LIST OF DRAWINGS

The CONTRACTOR shall furnish the following drawings for the switchgear:

22.1.1 Overall outline dimensions and general arrangement including plan, front elevation, rear & side elevations, clearances recommended in front and back.

22.1.2 Switchgear layout plan including floor openings, fixing arrangements and loading details.

22.1.3 Schematic control diagrams to cover controls, protection, interlocks, instruments, space heaters, etc. for each type of module.

22.1.4 (a) Detailed internal wiring diagram of each type of module, including terminal block numbers, ferrule numbers and the external cable connection designations

(b) Item wise bill of material for each module, listing all devices mounted and also otherwise furnished like cable glands, indicating the Manufacturer type, rating, quantity & special notes, if any.

22.1.5 Interpanel interconnection wiring diagram including terminal numbers and ferrule numbers.

22.1.6 Each type of protection relay and circuit breaker release characteristics

23.0 PROGRAMMABLE LOGIC CONTROLLER (PLC)

23.1 GENERAL

All PLCs shall be suitable for communication interface with suitable interface port, to communicate/collect data from digital meters or other equipments.

PLCs shall be of expandable type to add I/O modules as required. PLCs shall have slave modbus modules for third party integration (BMS).

Preferably PLC shall communicate with MODBUS protocol.

PLC shall be complete with rack/base for I/Os, CPU & power supply.

General parameters:

- Operating temp. : 0 to +50°C
- Degree of protection : IP20
- Certification : VDE 0631/ IEC 1131/UL

23.2 CPU

- CPU shall have minimum main memory of 32KB & load memory of 64KB to 2MB.

- Processing times
  Bit operation : 0.1 micro sec
  Word operation : 0.2 micro sec

- Bit memory : 128MB
- I/O address area : 1024/1024byte
- Digital channels : 200
- Analog channels : 25

23.3 I/O MODULES

A) DIGITAL INPUTS

- Voltage : 24V DC
- No. of channels : as required.
- Galvanic isolation : max. 8 channels in 1 group

B) DIGITAL OUTPUTS

- Voltage : 24V DC
- Output current : 0.5Amps
- No. of channels : as required.
- Galvanic isolation : max. 8 channels in 1 group

A) ANALOG INPUTS

- Current : 4-20mA DC
- Operating error : $\pm$ 0.5%
- Conversion time/channel : <3 ms
- No. of channels : as required.
- Galvanic isolation : max. 8 channels in 1 group

NOTES:

(a) The CONTRACTOR shall be entirely responsible for the correctness of the internal wiring diagrams

(b) The CONTRACTOR shall ensure that the characteristics of the CTs, fuses, protection relays, VTs and all other devices offered by him are such as to be suitable for the purpose for which they are intended.

23.4 TEST CERTIFICATES

23.4.1 Type test certificates of all standard component parts, e.g. contactors, breakers, switches, fuses, relays, CTs, VTs, and for the standard factory built assembly shall be submitted by the Contractor.

23.4.2 INSTRUCTION MANUALS

The CONTRACTOR shall furnish specified number of copies of the instruction manual which would contain detailed instructions for all operational & maintenance requirement. The manual shall be furnished at the time of despatch of the equipment and shall include the following aspects:

a) Outline dimension drawings showing relevant cross-sectional views, earthing details and constructional features.
b) Rated voltages, current, duty-cycle and all other technical information which may be necessary for correct operation of the switchgear.
c) Catalogue numbers of all components liable to be replaced during the life of the switchgear.
d) Storage for prolonged duration.
e) Unpacking.
f) Handling at site.
g) Erection.
h) Pre-commissioning tests.
i) Operating procedures.
j) Maintenance procedures.
k) Precautions to be taken during operation and maintenance work.

24.0 DATA SHEET TO BE FURNISHED BY THE CONTRACTOR

1	General	
2	Switchgear designation	
3	Make	
4	Busbar continuous rating	A
5	Short time rating (3.0sec.)	kA
6	Degree of protection provided for the enclosure (as per IS:2147 or equivalent)	
7	Earth bus bar size	mm^2
8	Busbars	

9	Material of busbars/size	mm^2
10	Maximum continuous current rating	A
11	Temperature rise over the specified ambient when carrying rated current	°C
12	Max. fault withstand current rating (3 sec.)	kA
13	Air break switches	
14	Make / Type / Applicable standards	
15	Rated current	A
16	Maximum through fault current withstand - for 1.0 sec	kA
17	Relays	
18	Make / Type (Vendor to list all the relays used)	
19	Auxiliary relays	
20	Make / Type	
21	Voltmeter	
22	Make / Type / Applicable standards	
23	Accuracy class	
24	Ammeter	
25	Make / Type	
26	Scale range	A
27	Accuracy class	
28	Indicating lamps	
29	Make / Type	
30	Voltage	V
31	Wattage of lamp	W

32	Push buttons	
33	Make / Type designation	
34	Space heater	
35	Make / Type	
36	Wiring & terminal blocks	
37	Voltage grade / Insulation	
38	Minimum size of conductor for -	
39	Power wiring	mm^2
40	Control wiring	mm^2
41	Type of terminal block/ current rating	/ A

25.0 POWER FACTOR CORRECTION PANEL (APFCR)

25.1 SCOPE

This Specification covers the design, material selection, and constructional features, manufacture, inspection and testing at the manufacturer's works, packing, transportation, delivery, testing and commissioning of Capacitor Panels. Which is of IGBT Based Details as per SLD.

25.2 POWER CAPACITOR EQUIPMENT CONSTRUCTION

The power capacitor shall be self-healing; metallised dry type and completely resin moulded in hermetically sealed containers, naturally cooled, indoor type.

Capacitors shall be designed, manufactured constructed and tested in accordance with IEC: 70.

The ambient temperature is 40^0C. The insulation level shall be in accordance with Clause 13 of IEC 70, i.e. able to withstand a power frequency AC. test voltage of 3 kV RMS for one minute.

The power losses shall not exceed 0.2 Watt / kVAR (or 0.4 watt / kVAR taking the discharge resistance into account).

The discharge device shall reduce the residual voltage from the crest value of 660 volts to 50 volts or less within one minute after the capacitor disconnected from the source of supply.

Facilities shall be provided for short-circuiting the capacitor terminals together and to earth before handling.

When capacitors may be switched off and on at very short intervals, arrangements shall be made so that, at the time of reapplication of the voltage, the voltage at the terminals of the capacitor shall be not more than 10% of the rated r.m.s. Voltage.

Each unit of capacitance shall be a 3 phase balanced load and controlled by a adequately rated triple pole contractor.

Each bank of capacitor units shall be provided with an incoming busbar chamber rated for the total load of the maximum number of capacitor units. Units shall be interconnected by an enclosed all insulated Aluminium busbar system. Connection links shall be provided to enable easy removal and relocation of units and the equipment shall allow for extension to each end of the busbar system.

Each unit of capacitance in a bank shall be provided with a red pilot light to indicate when the capacitor is operational.

25.3 PROTECTION AND AUTOMATIC CONTROL

A main circuit breaker complete with spring operated mechanism and operator independent shall be provided as the main protection for the automatic power factor correction equipment.

Circuit Breaker, Contactors, switching devices ratings shall be as per Single line diagram

All switching and protective devices and the connections shall be designed to carry continuously a current of 1.3 times the current, which would be obtained, with a sinusoidal voltage of RMS value equal to the rated voltage at the rated frequency.

An electronic reactive volt-ampere regulator shall switch automatically on the required number of blocks according to load, so as to maintain the power factor at the set value indicated by the reactive power regulator. The regulator controls the opening and closing of the capacitor switching contactors. The range of the regulator shall be 0.85 to 0.95.

Each contactor capacitor assembly is referred to as a capacitor step. The number of capacitor steps of switching operation shall be as per single line diagram.

Each regulator shall be equipped with a device that automatically disconnects all connected capacitors in the event of a power failure. When power is restored, the capacitors are re-connected according to system reactive power needs, avoiding excessive capacitive power.

An overload relay shall be fitted to trip the main incoming circuit breaker to the capacitor bank, and an out-of-balance current relay included to give visual / audible warning.

Fail-safe feature shall be incorporated to prevent leading power factor from every occurring.

All contactors and switching devices shall be suitable for capacitor switching and shall be designed such that restriking during breaking operation cannot occur and heavy inrush current shall not cause contact welding during making operation.

25.4 CUBICLE

25.4.1 A cubicle shall house the following

a) 1 Main incoming circuit breaker complete with external operating handle complete with padlocking facilities

(c) Contactors and other switching, protective and regulating devices.

(d) Connecting terminals for testing of circuits.

(e) Status indication lamps showing switching operation of each capacitor bank. Illuminated pushbuttons shall be of clustered LED type with Short Circuit protection, Surge Protection etc.

(f) Adequately rated CTs and PTs

(g) Ammeter, Voltmeter and Power factor meter.

(h) Anti-condensation heaters of standard make complete with thermostatic control. The capacity of the anti-condensation heaters shall be such that the power rating shall be equivalent to that dissipated by the cabinet during normal operation. The anti-condensation heaters shall only be activated when the Electrical Distribution System is shutdown.

25.4.2 Technical Specification

1.	Type of Capacitors	:	MPP / with preferably NCPB / inert gas / Polypropylene impregnated.
2.	System Voltage	:	415V +/- 10%.
3.	Rated Voltage of capacitor	:	433 V+10%
4.	Rated frequency	:	50Hz + 3%
5.	Number of phases	:	3
6.	Max. permissible over voltage/duration for satisfactory operation	:	10% over and above the rated voltage continuous
7.	Rise in maximum temp on continuous:	:	10 Deg C max. kVAR output under operating ambient temp. of 50 Deg C.
8.	Watt loss per KVAR (Di-electric)	:	Max. 0.2 Watt / kVAR
9.	BIL	:	2.5kV AC
10.	Connection	:	Internally Delta Connected.
	a. Discharge Device	:	Internal resistor
	b. Discharge time	:	Discharging to 50V in 60 sec
	c. Min. time interval required between de-energisation and re-energisation of the capacitors with regard to the duty on discharge device.	:	60 sec
10.	Permissible limit of unbalance	:	5%
11.	Detailed technical particulars of the insulating medium in the capacitor	:	

12. Type of impregnating oil	:	Non-PCB, Non-toxic, Bio-degradable / inert gas capacitor.
13. Type of container	:	CRCA / Extended Aluminium
14. Thickness of container sides	:	2.5mm
15. Reference Standard	:	IS:2834 -1986 and IS:13340-1996

26.0 Specification for Series Reactor

Standards: The reactor shall confirm to IS 5553.

26.1 Objective:

The objective of connecting a reactor in series with the capacitor is to avoid resonance between the inductive impedance of the supply transformer plus the line cabling and capacitors installed for power factor improvement in networks polluted with harmonics. In order to avoid resonance to the 5^{th} harmonic and above reactor should have a reactance of 7% ie a resonance frequency of 189 Hz for 50 Hz network.

26.2 Construction:

The reactors should be built with a core made of oriented grain iron sheet with spilt air gaps so as to give excellent anti saturation characteristics and very low losses. The coils can be made either with insulated copper bars or with aluminium sheet insulated with NOMEX.

The input/output connections should be made through tinned copper bars. The coil windings should be provided with ventilation space for allowing adequate heat evacuation even hot ambience. The reactor should be vacuum impregnated with a varnish having high insulation properties.

Technical characteristics of the Reactor

• Insulation level	:	4.0 KV
• Tolerance of L	:	3%
• Linearity (5% OF L) to	:	1.66 x 2 RMS = 1.8 In
• Maximum ambient temperature	:	50 Deg C.
• Internal insulation	:	Class F (155 deg C)
• Maximum Load – continuous	:	1.1.In.
• Transient (1 min)	:	2 In.
• Constructive standards	:	As per relevant IS/IEC Stds.
• Losses Temperature Protection switch (NC)	:	Below 8 watts / KVAR / Micro

26.3 TESTS

(a) Type tests, viz

CONTRACTOR shall furnish type test certificates for similar capacitor banks, In

the absence of the same, CONTRACTOR shall perform the type tests without any cost implication to the EMPLOYER.

(b) Routine test

The following tests for the power capacitors shall be carried out in accordance with IEC 70

(i) Capacitance

(ii) Capacitor Losses

(iii) A C HV test between terminals

(iv) A C voltage test between terminals and container dry test.

(v) Tests between terminals and earth for capacitor banks

Routine tests shall be carried out on every capacitor on completion.
Witnessing of tests is at the discretion of the EMPLOYER / ENGINEER. Hence, inspection call for the equipment shall be given in advance for the EMPLOYER / ENGINEER to make suitable arrangements.

27.0 DETAILS TO BE SUBMITTED BY THE BIDDER

a) Final General Arrangement drawings
b) Single Line diagram
c) Scheme Drawing
d) Complete Bill of Materials
e) Guaranteed rated values and characteristics.

28.0 TECHNICAL DATA SHEET

SI.NO.	Description	Data
	CAPACITOR BANK	
	(The Contractor shall fill respective data; Supplement catalogue, write-up technical literature etc., shall not be referred as alternative)	
1	Name of the manufacturer	
2	Nominal system voltage	
3	Highest system voltage	
4	Frequency	
5	Suitable for system neutral earthing	

6	Design ambient temperature	
7	Insulation level a) Power frequency withstand voltage (KV rms) b) Impulse withstand voltage (KV peak)	
8	Capacitor bank	
	a) Rated output b) Rated voltage c) Rated current d) Rated output of each capacitor unit e) No.of units per bank f) Capacitance of each unit g) No. of series groups/phase h) No. of units in parallel /series groups i) Type of dielectric j) Type of connection k) Unit protection l) Losses in watts/KVAR(at rated , freq,) m) Colour of the bank n) Max. Permissible over voltage of each unit	
9	Particulars of discharge resistor a) Thickness of enclosure sheet b) Type of mounting c) Degree of protection d) Colour of the panel e) Particulars of components to be mounted on the panel	
10	Over all dimension and weight (approx.) of 415V	
11	Enclosed photo copies of type test reports	Yes/No
12	Enclosed relevant catalogue and write-ups	Yes/No
13	Delivery period	
14	List of commissioning spare(Rate to be included in main offer as sub heading)	
15	Recommended spare for 2 year Operation.(separate price list to be provided)	

ELECTRICAL INSTALLATION

1.0 SCOPE

The scope of work under this section generally covers internal wiring for light, exhaust, fan coil units, power sockets etc., The contractor shall provide all materials, labour, equipment, scaffoldings, etc., as required for the completion of wiring installation called for. The wiring shall generally be done using PVC insulated copper conductor wires in PVC/M.S./G.I conduit as called for including providing switches, sockets, plug tops, outlet boxes etc.,

2.0 STANDARDS APPLICABLE

The applicable standards for above work shall be as listed below:

IS: 732 Code of practice for electrical wiring installation
(System voltage not exceeding 650 V).
IS : 1646 Code of practice for fire safety of buildings (General Electrical installation).
IS : 2667 Fittings for rigid steel conduits for electrical wiring.
IS : 3480 Flexible steel conduits for Electrical wiring.
IS : 3837 Accessories for rigid steel conduit for electrical wiring.
IS : 694 PVC insulated cables.
IS : 2509 Rigid - non-metallic conduits for electrical wiring.
IS : 6946 Flexible (Pliable) non-metallic conduits for electrical installation.
IS : 1293 3 Pin plugs and sockets.
IS : 8130 Specifications for conduits for electrical installation.
IS : 3854 Switches for domestic purpose.
IS : 3415 Fittings for rigid non-metallic conduits.
IS : 4648 Guide for electrical layout in residential building.
IS : 9537 Conduits for electrical installation.
IS : 302 General and safety requirements for household and similar electrical appliances.
IS : 5216 Guide for safety procedures and practices in electrical work.
Indian Electricity Act and Rules.

3.0 POINT WIRING FOR LIGHTS, EXHAUST FANS & 5A CONVENIENCE SOCKETS

A point wiring shall consist of the branch wiring from the distribution board together with a switch as required, including providing conduit and accessories, the ceiling rose or pendant holder or a swan holder or socket etc., with suitable termination.

Point wiring shall include, in addition, the earth continuity conductor/wire from the distribution board to the earth pin/stud of the outlet/switch box and to the outlet points. The point wiring shall be carried out in the under mentioned manner:

a) Supply, installation, fixing of conduits and GI pull wire with necessary accessories, junction/pull/inspection/switch boxes and outlet boxes etc. Switches, switch plates and switch boxes are not required for the lights which are controlled directly from the MCB DB's.

b) Supplying and drawing of wires of required size including earth continuity PVC insulated wire.

c) Supply, installation and connection of flush type switches, sockets, cover plates, switch plates and fixing , lamp holder, ceiling rose etc.,

d) The point shall be complete with the branch wiring from the distribution board to the outlet point, through switch board, conduit with accessories, junction, pull, inspection boxes, control switch, socket, outlets boxes, ceiling roses, lamp holder, connector, extension cord wire, flexible conduits etc.,

a) Outdoor terrace exposed Sockets, Switches should be of weather proof.

4.0 POINT RATE

For purposes of measurements and payments the rate for point wiring for lights etc., is divided into two parts.

a) Circuit Main
b) Point Wiring

a) Circuit Main for Light Point

The circuit main for lights/6A sockets (where 6A sockets connected to light circuit) shall include the wiring from the MCB distribution boards upto the first switch/light point This is measured in linear meter. The scope of work under this section shall include

i) Supply and wiring in concealed/surface conduit from DB's to first switch/light point.
ii) Providing and installing PVC insulated copper conductor earth wire.
iii) Providing and installing GI fish wire (pull wire) in the conduit.
iv) Termination of wires in DB's and switches using proper tinned copper lugs of crimping type.
v) Providing and installing necessary pull/junction boxes where necessary.

b) Point Wiring

The rate for point shall include supply, installation, and connection, testing and Commissioning of point Cost to include Loop in & Loop out.. The exact scope of work included in the point wiring for the purposes of measurement is enumerated as stated below

i) Wiring starting from the first switch / light, where the circuit main is terminated to the Various lights / sockets (where 6A sockets connected to light circuit loop), and then looping between the switches / lights / 6A sockets etc.,

ii) Providing and installing all necessary switches, switch plates, sockets, pull/junction/fan Hook boxes etc. as called for.

iii) Providing and installing insulated earth continuity wire in each conduit along with the wiring system.

iv) Providing installing G.I. fish wire (pull wire) in the conduits.

v) Providing and installing G.I. fish wire (pull wire) in the conduits.

vi) Providing and installing PVC insulated, PVC sheathed flexible three core

1.5 Sq.mm extending cords including flexible conduits from light / fan outlet points mounted at ceiling point to the light outlet. Wiring for 6A Sockets, 16A Power Sockets for Equipment Wiring Except where 6A sockets connected to the lighting loop which are measured in Number of points, the measurement for wiring of 6A/16A sockets and wiring for power outlets is done as follows :

vii) Fitting to ceiling conduit detais (preferences for ceiling rose in junction box at ceiling level & upto the fitting double insulated 3 core cable to be used.

Length of circuit wire including conduit, accessories and earth wire for power wiring is measured together in linear metre.

The socket outlet with outlet box is measured in Numbers.

5.0 SYSTEM OF WIRING

Unless otherwise mentioned on the drawings, the system of internal wiring shall be as follows:

The system of wiring shall consist of single core, PVC insulated, 650/1100 Volt grade, Stranded copper conductor wires/cables laid through concealed or exposed PVC/GI/MS conduits as mentioned elsewhere or as directed by BRBNMPL/consultant.

5.0 GENERAL

Prior to laying and fixing of conduits and light outlet boxes, contractor shall carefully examine the layout drawings and prepare detailed shop drawings, indicating the exact location of light outlets, with distances marked, conduit routing, with sizes, number of wires run in each conduit, control switch location etc.,

The contractor shall obtain the approval of all shop drawings & qty by the BRBNMPL/consultant prior to the installation of conduits. Any discrepancy noticed in the design drawings shall be brought to the notice of the BRBNMPL/consultant. Any suggestions or modification suggested by the contractor shall have approval of Client/ Consultant before execution.

5.1 Type of Installation

Unless otherwise specified all conduits for surface wiring shall be heavy guage rigid GI/MS conduits and all concealed installation including conduits running above false Ceiling shall be heavy gauge rigid PVC.

All conduits buried in grade or in damp wet areas shall be heavy gauge G.I. conduits.

a) Concealed Wiring shall be done using PVC conduits in the following areas
   i) Staircase area lighting
   ii) Wiring inside services rooms
   iii) Wiring in the false ceiling area
   iv) All other area where surface conduit is not specially mentioned.

b) Surface wiring shall be done using PVC Conduit.
   i) Wiring installation in the electrical sub-station room, D.G.room

ii) Pump room, Sewage treatment plant room.
iii) Ventilation fan room, AHU room, electrical room

c) Conduit installation in False Ceiling Area
i) The PVE conduits shall run exposed using above false ceiling.

6.0 MATERIALS

CONDUITS
a) PVC CONDUITS:
Non-metallic conduits and accessories shall conform to IS 9537 (part 3) - 1983, IS 2509 & IS 3419 and each conduit shall bear the ISI Mark. PVC conduits shall be of the black, round, heavy gauge polyvinyl chloride (PVC). The conduit shall be plain end type as specified in IS 2509-1973/IS 2537-1983. The conduit internal surface shall be smooth. Only approved quality factory made bends/accessories shall be used. Minimum size of conduits shall be 20mm diameter.

PVC conduits shall be rigid unplasticised, heavy gauge having minimum wall thickness of 2.0mm upto 25mm diameter conduit and 2.5mm wall thickness for all sizes above 25mm diameter.

c) CONDUIT ACCESSORIES:

PVC CONDUIT BENDS & COLLARS

The PVC conduit bends & collars shall be of heavy duty and preferably of the same make as of conduit. This shall conform to IS 9537/1983 Part III with ISI Mark where necessary bends or diversion may be achieved by means of using bends and or circular inspection boxes with adequate and suitable inlet and outlet termination. In case of recessed installation system.

The bends shall be properly secured & flush with the finished wall surface. Elbows shall not be used. No bends shall have radius less than 2 1/2 times the outside diameter of the conduit.

PVC/INSPECTION/JUNCTION/PULL BOXES

The Inspection/pull box/junction box, where used, with relevant PVC conduit installation shall be of heavy gauge PVC and conform to IS specification and shall match with the conduit sizes. The box shall be round/square rectangular with conduit stub projection for termination of conduit.

The box shall be of minimum 50mm deep and the size of box shall be suitable to pull/make necessary joints of wires inside the boxes. Extra deep boxes are preferred. The boxes shall have flush type cover. The colour of plate shall match the colour of paint of the surface where installed. The boxes shall have concealed screwed socket for fixing the ceiling rose.

d) SWITCH OUTLET & SOCKET OUTLET BOXES

CONCEALED TYPE OUTLET BOXES

The concealed outlet boxes for switches, sockets, power outlets, telephone outlet, etc., shall be of standard factory made and to match the exact requirement of combination of outlets. The boxes shall be fabricated out of heavy gauge CRCA cold rolled carbon alloy sheet steel with zinc plating (G.I). The size of boxes shall match the type of outlet/switch plate to be mounted on the box. Adequate No. and size of knockout holes shall be provided to terminate the conduits in the box. These boxes shall be of standard factory made product and of same make as of switch plates and sockets. Separate screwed earth terminal shall be provided in the box for earthing.

The outlet box shall be of minimum depth of 50mm.Boxes shall be suitable for grid mounting type of accessories. Long screw shall be provided to take care of the extra plaster thickness to mount the switch plates. Provision shall be made in the box and switch plate to have the minor adjustment of alignment of switch plate to plumb level.

e) SURFACE TYPE BOXES:

The boxes for mounting switches, sockets and other wiring devices shall be either moulded plastic or heavy gauge CRCA sheet steel painted to match the colour of wall. The box shall be suitable to terminate the G.I/M.S. surface conduit into the box.

The size and shape of box shall match the exact type and combination of switch plates, receptacles and wiring devices. Deep boxes shall be used to facilitate easy termination of conduit and wires/cables. Separate screwed earth terminal shall be provided in the box for earthing.

f) LIGHT OUTLET BOXES :

For concealed PVC conduit installation the light outlet box shall be of PVC round /square with knock-out holes. Conduit projection shall be suitable to terminate the conduit to the box. The box shall be made of heavy gauge PVC and the sample to have the approval of Construction Manager before use.

The boxes shall have concealed screwed socket to fix the ceiling rose. The boxes shall be minimum 50mm deep.

For surface conduit installation the light outlet box shall be of G.I/black enamelled M.S. boxes. The boxes shall have threaded stub projection having internal threading to terminate the conduits of different sizes. The boxes shall have concealed screwed socket for fixing the ceiling rose.

The boxes shall be minimum 50mm deep side extensions of rod shall be sufficiently long to provide adequate anchorage in the concrete. The size of the box shall be such that it should be totally covered by the plastic canopy of the ceiling . The box shall have anticorrosive primer coating.

g) SWITCHES

Switches shall conform to IS : 3854, and IS : 4615. Switches shall be single pole, single or two way as shown on the drawings. They shall be of the molded type rated for 250V, 5/15A. They shall be provided with insulated dollies and covers.

The switches shall be rocker operated with a quiet operating mechanism with bounce-free, snapacting mechanism in an arc resistant chamber. The switches shall have pure silver and silver cadmium contacts.

The switches shall be of approved make as indicated in the `List of Approved Makes'. Switches installed outdoors shall be industrial, metal clad type, and shall be provided in weather-proof enclosure, complete with weather proof gasketed covers.

h) COVER PLATES FOR SWITCHES & OUTLETS

Switches/sockets/wiring devices plates shall be of the same make as of switches/sockets/wiring devices. These shall be of best quality. Moulded plastic grid mounting type device plates/frames shall be used and these shall match with the type of switches/sockets and boxes.

i) COVER PLATES FOR INSPECTION/JUNCTION/PULL BOXES

The cover plate for PVC boxes shall be with minimum 3mm thick Perspex / formica sheet cover and for the G.I/M.S. boxes, shall be of G.I/black enamelled M.S. plates. The shape of the plate shall match with that of the box.

j) RECEPTACLES

The sockets shall conform to IS 1293. Each socket shall be provided with control switch of appropriate rating. The sockets shall be moulded type rated for 250 volts and of 6 A or 16 A capacity as mentioned on the drawings.

The 16 Amps sockets shall be multi pin (6 pin) automatic shutter type suitable for plugging 6 A/16 A plugs. The shutter shall open when the earth pin of the plug is inserted in the socket. Where called for, the 16 A socket shall have indicating lamp.

The socket outlets and switches shall be of grid mounting type. Where called for sockets shall be provided with three pin plug top suitable to the socket and of the same make as of socket. The plug shall conform to IS 6538. The socket outlets installed outside the building/open to sky or in damp/wet areas shall of weather-proof, water-tight type.

k) INDUSTRIAL TYPE SOCKETS

The socket outlets single phase or three phase installed in electrical room, D.G room etc., shall be three pin or 5 pin industrial type with MCB (1 phase or 3 phase) control. The socket and MCBs shall be mounted in a sheet steel enclosure and shall be standard factory made product.

l) CONDUCTORS

All PVC insulated copper conductor wires shall conform in all respects to standards as listed under sub-head 'Regulations and Standards' and shall be of 650/1100V Grade.

7.0 PVC INSULATED WIRES (FOR LIGHT & SMALL POWER WIRING)

The PVC cables shall conform to IS : 696/1977. For all internal wiring PVC insulated cables of 650/1100V grade, single core shall be used. The wires shall have the approval of Tariff Advisory Committee. The conductors shall be plain, circular
stranded annealed copper conductors complying with BS: 6360.

The minimum number and diameter of wires for circular stranded conductor shall meet the requirements set out in the relevant British Standards.

The insulation shall be PVC compound complying with the requirements of BS: 6746.
It shall be applied by an extrusion process and shall form a compact homogeneous body. The PVC compound shall comply with the requirements of IS 5831-84.

The cores of all cables shall be identified by colours in accordance with the following sequence.

Single phase - Red
Three phase - Red, Yellow, Blue
Neutral - Black
Earth - Green or Green/Yellow.
A means of identifying the manufacturer shall be provided throughout the length of cable.

Unless otherwise specified in the drawings, the sizes of the cables/wires used for internal wiring shall be as follows :

In case of circuit wiring for lights, exhaust fans, convenience socket outlet points

a) 2.5 Sq.mm - For Lights 5A socket wiring from DB's upto the outlet points including control wiring where the circuit length from the DB's to 1st outlet is less than 40 m. In case of power socket outlet circuit.
b) 6.0 Sq.mm - From DB's 20/32 A Industrial type sockets.
c) 4.0 Sq.mm - From DBs to 16 A sockets.
d) 3core x 4.0sqmm – From DBs to UPS sockets

The earth continuity conductor size as indicated in the drawing/SOQ shall be drawn through conduit along with other circuit cables/wires. The size of the earth continuity conductor shall be as follows

UNLESS OTHERWISE SPECIFIED MINIMUM SIZE OF EARTH CONTINUITY CONDUCTOR WIRES NOT FORMING PART OF THE SAME CABLE AS THE ASSOCIATED CIRCUIT CONDUCTOR

Nominal Cross sectional area of largest associated copper circuit conductor in Sq.mm	Nominal cross sectional area of earth continuity conductor in Sq.mm (PVC insulated green colour wire)
1.5	2.5
2.5	2.5
4.0	2.5
6.0	4.0
10.0	6.0
16.0	6.0

25.0	10.0
35.0	10.0
50.0	10.0

Separate circuits shall run for each 16 A Power circuit.

8.0 INSTALLATION OF CONDUIT

CONCEALED CONDUIT SYSTEM

Unless otherwise Specified, all wiring shall be in heavy gauge rigid PVC conduit embedded in wall, or ceiling and concealed in the false ceiling. The size of the conduit shall be selected in conformity with I.S. code and as specified in the table given below. Factory made conduit bends and accessories shall be used. PVC Conduit shall be jointed using Solvent Cement as recommended by the conduit supplier.

The conduit in ceiling slab shall be straight as far as possible. Before the conduits are laid in the ceiling, the position of the outlet points, controls, junction boxes shall be set out clearly as per the dimensions and to minimise off-sets and bends.

Before the reinforcement rods are kept in position electrical contractor shall mark in paint the position of outlet points and conduit drop on the shuttering. When the outlet boxes are kept in position and before pouring the concrete, all outlet boxes shall be filled with paper to avoid entry of concrete into the box.

Conduits in ceiling shall be bonded to the reinforcement rods with G.I. bonding wire at intervals not more than 1000mm, to secure them in position. PVC deep light outlet / pull boxes shall be provided as required. The conduit in ceiling slab shall be laid above the first layer of reinforcement rods to avoid cracks in the ceiling surface.

In general the conduit shall not be laid directly on the shuttering surface to avoid cracks in the ceiling surface. Conduits concealed in the wall shall be secured rigidly by means of steel hooks / staples at min. 750 mm intervals. Before conduit is concealed in the walls, all chases, grooves shall be neatly made to proper required dimensions using electrically operated groove cutting tools to accommodate number of conduits. The outlet boxes for control switches, inspection and draw boxes shall be fixed as and when conduits are being fixed.

The recessing of conduits in walls shall be so arranged as to allow atleast 12mm plaster cover on the same. All grooves, chases etc. shall be refilled with 1:4 cement mortar and finished upto wall surface before plastering of walls is taken up by the general civil contractor. Horizontal hases in walls are not allowed. Where unavoidable, prior permission of BRBNMPL/consultant shall be obtained before making any chasing.

Where conduits pass through expansion joints in the building, adequate expansion fitting or other approved devices shall be used to take care of the relative movement.

Whenever the conduits terminate into control boxes, distribution boards etc. conduits shall be rigidly connected to the boxes/boards with check nuts on either side of the entry.

After conduits, junction boxes, outlet boxes etc. are fixed in position, their outlets shall be properly plugged with PVC stoppers or any other suitable materials, so that water, mortar, vermin or any other foreign materials do not enter into the conduit system. All conduit ends terminating into an outlet shall be provided with bushes of PVC or rubber after the conduit ends are properly filed to remove burrs and sharp edges.

Necessary G.I. pull wires shall be inserted into the conduit for drawing wires before concreting. Insulated earth wires shall be run in each conduit originating from the panel board upto the Light, Socket and Switch boxes. If the Electrical Contractor forgets to install any conduit/boxes etc., before the plastering/painting work is done by other agencies, he may be permitted to install the same with conduits shall be so arranged as to facilitate easy drawing of wires through them.

Entire conduit layout shall be done in such a way as to avoid additional junction boxes other than light points. The wiring shall be done in a looping manner. All the looping shall be done in either switch boxes or outlet boxes. Joints in junction or pull boxes are strictly not allowed. Where conduits cross building expansion joints, adequate expansion fittings or other approved devices shall be used to take care of any relative movement.

All conduits shall be installed so as to avoid touching of steam and hot water pipes.
Conduits shall be installed in such a way that the junction and pull boxes shall always be accessible for repairs and maintenance work. The location of junction/pull boxes shall be marked on the shop drawings and approved by the BRBNMPL/consultant.

A minimum separation of 200mm shall be maintained between electrical conduits and water lines in the building.

No run of conduit shall exceed ten meters between adjacent draw-in points nor shall it contain more than two right angle bends, or other deviation from the straight line.

Caution shall be exercised in using the PVC conduits in locations where ambient temperature is 50 degree celsius or above. Use of PVC conduits in places where ambient temperature is more than 60 degree C is prohibited. The entire conduit system including boxes shall be thoroughly cleaned after completion of installations and before drawing of wires. Conduit system shall be erect and straight as far as possible. Traps where water may accumulate from condensation are to be avoided and if unavoidable, suitable provision for draining the water shall be made.

All jointing methods shall be subject to the approval of the BRBNMPL/ Consultant.

Separate conduits shall be provided for the following system.

- Lighting wiring
- 16 Amp power outlets.
- 6 Amp outlets and lighting system.
- 24 Volt supply system.
- Telephone/intercom system,
- Fire Alarm system,
- Computer data cabling system.
- Equipment wiring.

9.0 CONDUIT JOINTS

Conduits shall be joined by means of plain couplers. Where there are long runs of straight conduits, pull/inspection boxes shall be provided at intervals, as approved by the BRBNMPL/consultant/construction manager. The conduits shall be thoroughly cleaned before making the joints. In case of plain coupler joints, proper jointing material like a vinyl solvent cement (gray in color) or any material as recommended by the manufacturer shall be used.

10.0 BENDS IN CONDUIT

Wherever necessary, long bends or diversions may be achieved by bending the conduits or by employing normal bends. No bends shall have radius less than 2.5 times outside diameter of the conduit. Heat may be used to soften the PVC conduit for bending, but while applying heat to the conduit, the conduit shall be filled with sand to avoid any damage to the conduit. Kinks in the conduit bends shall not be acceptable.

11.0 BUNCHING OF CABLES

Cables of AC supply of different phases shall be bunched in separate conduits. The number of insulated wires/cables that may be drawn into the conduits shall be as per the following table. In this table, the space factor does not exceed 40%. However, in any case conduits having less than 20mm diameter shall not be used.

MAXIMUM PERMISSIBLE NUMBER OF 650 VOLT GRADE SINGLE CORE WIRES THAT MAY BE DRAWN IN TO RIGID PVC CONDUITS.

Cable Size in Sq.mm	Size of Conduits (mm) (Max No. of Wires)				
	20	25	32	40	45
0.5	4	8	14	-	-
2.5	4	6	10	-	-
4.0	3	4	8	12	-
6.0	2	4	6	8	-
10.0	1	3	5	10	-
16.0	0	2	4	5	12

c) Wires carrying current shall be so bunched in the conduit that the outgoing and return wires are drawn into the same conduit. Wires originating from two different phases shall not be run in the same conduit.

WIRING :

d) All final branch circuits for lighting and appliances, shall be single conductor cables run inside conduits. Branch circuit conductor sizes shall be as shown in the load analysis of drawing and conforming to the requirements of the I.E. Regulations and I.S. Code. Home runs indicated on the drawings for the final branch circuits shall be kept in a separate conduit upto the panel board via switches wherever called for. No other wiring shall be bunched in the conduit unless the other circuit main of same phase runs in the same conduit.

e) For each lot of wire supply, Contractor shall supply a certificate issued by the Manufacturer stating its origin, date of manufacture, constitution and standards to which it complies and the test certificates.

Looping system of wiring shall be used. Wires shall not be jointed inside the conduit or pull boxes. Where joints are unavoidable, they shall be made through approved mechanical connectors with prior permission of BRBNMPL/consultant.

Control switches shall be connected in the phase conductors only and shall be 'ON' when knob is down. Switches shall be fixed in galvanised steel boxes. Chromium plated screws shall be used.

Power wiring shall be distinctly separate from lighting wiring.

Each circuit phase wire from the distribution boards should be followed with a separate neutral wire of the same size as the circuit wire.

12.0 BUNCHING OF WIRES:

Wires carrying current shall be bunched so that the outgoing and the return wires are drawn in the same conduit. Wires originating from two different phases shall not run in the same conduit.

13.0 DRAWING CONDUCTORS:

The drawing and jointing of PVC insulated copper conductor wires and cables 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 cause breakage of conductors. There shall be no sharp bends.

Insulation shall be shaved off like sharpening of a pencil and it shall not be removed by cutting it square.

PVC insulated copper conductor wire ends shall be soldered (atleast 20 mm length). Strands of wires shall not be cut for connecting terminals. The terminals shall have sufficient cross sectional area to take all strands and shall be soldered. Connecting brass screws shall have flat ends. All looped joints shall be soldered and connected through block/connectors.

The pressure applied to tighten terminal screws shall be just adequate, neither too much nor too less. Conductors of all sizes shall always be terminated using cable sockets. At all bolted terminals, brass flat washers of large area and approved steel spring washers shall be used. Brass nuts and bolts shall be used for all connections.

Only certified wiremen 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. For all internal wiring, PVC insulated wires of 650/1100 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. If the use of joint connections are unavoidable due to any specific reason, prior permission, in writing, shall be obtained from the BRBNMPL/consultant. 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 in pulling the wires so that no damage occurs to the insulation of wire. Before the wires are drawn into the conduits, the conduits shall be thoroughly

cleaned of moisture, dust, dirt or any other obstruction by forcing compressed air through the conduits. The minimum size of PVC insulated conductor wires for all sub-circuit wiring for light points shall be 2.5 sq.mm.

14.0 JOINTS:

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

15.0 MAINS AND SUB-MAINS:

Mains and sub-mains cables or wires where called for shall be of the rated capacity and approved make. Every main `and sub-main wire shall be drawn through an independent adequate size conduit. An independent earth wire of the proper rating shall be provided for every single phase

sub main. For every 3-phase sub main, 2 nos. earth wires of proper rating shall be provided along with the sub main. The earth wires shall be drawn inside the conduits along with the circuit main. Where mains and sub-mains cables are connected to switchgear, sufficient extra lengths of cables shall be provided to facilitate easy connections and maintenance.

16.0 LOAD BALANCING:

Load balancing of circuits in three phase installation shall be planned before the Commencement of wiring and shall be strictly adhered to.

17.0 COLOUR CODE OF CONDUCTORS:

Colour code shall be maintained for the entire wiring installation: red, yellow, blue for three phases, black for neutral, green/yellow green for earthing.

The control wire from light control switches to the light/fan points shall be the same colour as that of the phase/circuit wires feeding that particular loop.

19.0 COMPLETION CERTIFICATES

All the above tests shall be carried out in presence of Construction Manager and the results shall be recorded in prescribed forms. Any default during the testing shall be immediately rectified and that section of the installation shall be retested. The completed test result forms shall be submitted to the BRBNMPL/consultant.

On completion of an electric installation a certificate shall be furnished by the contractor, countersigned by the certified supervisor under whose direct supervision the installation was carried out.

20.0 MEASUREMENTS

Mode of measurement is as follows:

For purposes of measurement the point wiring for lights/6A sockets (where 6A

sockets are connected to lighting circuit loop) is divided into two parts.

a) Point Wiring
b) Circuit Main

a) POINT WIRING

The wiring for light/6A socket (where 6A sockets are connected to lighting circuit loop) point starting from first light/switch and looping between switches/sockets etc., shall be measured either in `Number' or `Set'.

- One light point controlled by one switch is measured in Number (No.)
- Set of Two or more light points controlled by one switch is measured in `Sets'.
- Where set of light points wired and controlled directly from MCB DB shall be measured in
- `Sets'. The rate for this item shall not include the cost of switch & switch box.
- 6A socket wiring where connected to the lighting circuit loop is measured in Number (No.)

b) CIRCUIT MAIN

The length of circuit main including conduit starting from MCB DB to first switch/light shall be measured separately in `Linear Metres' (Rm). (Further wiring is measured in point wiring).

Circuit main for Wiring 6A Sockets shall be measured under point wiring for 16A Sockets and Power Outlets the wiring shall be measured as under Circuit mains.

LIGHTING SYSTEM

1.0 SCOPE

This specification covers the design, material specification, manufacture, testing, inspection and delivery to site of lighting system equipment such as lighting fixtures, lighting poles and other similar items necessary for lighting system.

2.0 STANDARDS

The items of supply comply with the latest applicable standards as specified in specification. Where no standards are available, the supply items shall be backed by test results, shall be of good quality and workmanship.

2.1 REFERENCE STANDARDS

2.1.1 INTERIOR LIGHTING

Standards mentioned below are only guidelines. The equipments and works shall be carried out as per the latest standards.

IS 1777: 1978	Industrial Luminaire with metal reflectors and its Amendments.
IS 1913 (Pt 1): 1978	General and safety requirements for luminaries: Part-1 Tubular flourescent Lamps (Second revision).
IS 1944 (Pt.5): 1981	Code of practice for lighting of public thoroughfare: Part-5 Lighting for grade separated junctions, bridges and elevated roads (Group D)
IS 1944 (Pt.6): 1981	Code of practice for lighting of public through fare: Part-6 Lighting for town and city centers and areas of civic importance (Group-E).
IS 1944 (Pt.7): 1981	Code of practice for lighting of public thoroughfare: Part-7 Lighting for roads with special requirements (Group F)
IS 1944 (Pt 1&1): 1970	Code of practice for lighting of public thoroughfare: Part 1 and 2 for main and secondary roads (Group A and B) (first revision) (Part 1 and 2 in one column).
IS 2206 (Pt.1): 1984	Flameproof electric lighting fittings: Part-1 Well-glass and bulkhead types (first revision).
IS 2206 (Pt.2): 1976	Flameproof electric lighting fittings: Part-2 Fittings using glass tubes.
IS 2206 (Pt.3): 1989	Flameproof electric lighting fittings: Part-3 Fittings using plastic tubes (Group-1 only).
IS 2206 (Pt.4): 1987	Flameproof electric lighting fittings: Part-4 Portable flameproof hard lamps
IS 3287: 1965	Industrial lighting fittings with plastic reflectors.
IS 3528: 1966	Waterproof electric lighting fittings
IS 3553: 1966	Waterproof electric lighting fittings.

IS 3646 (Pt.1): 1992	Code of practice for interior illumination: Part-1 General requirements and recommendations for welding interiors (first revision).
IS 3646 (Pt.2): 1966	Code of practice for interior illumination: Part-2 Schedule of illumination and glare index.
IS 3646 (Pt.3): 1968	Code of practice for interior illumination: Part-3 Calculation of coefficients of utilization by the BZ method.
IS 3528: 1966	Specifications for Waterproof lighting fittings.
IS 5216 (Pt.1): 1982	Recommendation on safety procedures we practice in Electrical Work.
IS 4012: 1967	Dust-proof electric lighting fittings.
IS 4013: 1967	Dust-proof electric lighting fittings.
IS 5077: 1969	Decorative lighting outfits
IS 6665: 1972	Code of practice for Industrial lighting.
IS 7569: 1987	Cast acrylic sheets for use in luminaries (first revision)
IS 7678: 1975	Method of photometric testing of incandescent type luminaries for general lighting service.
IS 8224: 1976	Electric lighting fittings for division 2 areas.
IS 9583: 1981	Emergency lighting units.
IS 10322 (Pt.1): 1982	Luminaries: Part-1 General requirements.
IS 10322 (Pt.2): 1982	Luminaries: Part-2 Constructional requirements.
IS 10322 (Pt.3): 1984	Luminaries: Part-3 Screw and screw less terminals (superseding IS: 6505)
IS 10322 (Pt.4): 1984	Luminaries: Part-4 Methods of tests.
IS 10322 (Pt.5/Sec1): 1985	Luminaries: Part-5 Particular requirements, Section-1 General purpose luminaries.
IS 10322 (Pt.5/Sec2): 1985	Luminaries: Part-5 Particular requirements, Section-2 Recessed luminaries.
IS 10322 (Pt.5/Sec3): 1985	Luminaries: Part-5 Particular requirements, Section-3 Luminaries for Road & Safety lighting.
IS 4648: 1968	Guide for Electrical layout in Residential Buildings.
IS 6616	Ballast for mercury vapour lamp.
IS 9900 (Pt.1&2)	HPMV requirements, test and standard lamp Data Sheet.
IS 2418	Tubular fluorescent lamps
IS 1534: 1977	Ballast for use in flourescent lighting fittings.
IS 1569: 1976	Capacitors for use in FL, HPMV & LPSV lamp circuits.

IS 9974: 1981	High pressure sodium vapour lamps
IS 9583: 1981	Emergency light units.

2.1.2 EXTERNAL LIGHTING

Standards mentioned below are only guidelines. The equipments and works shall be carried out as per the latest standards.

NOTE: All Outdoor terrace exposed light fixtures should be of weather proof.

IS 1777: 1978	Industrial Luminaire with metal reflectors and its Amendments.
IS 1913 (Pt 1): 1978	General and safety requirements for luminaries: Part-1 Tubular flourescent Lamps (Second revision).
IS 2206 (Pt.1): 1984	Flameproof electric lighting fittings: Part-1 Well-glass and bulkhead types (first revision).
IS 2206 (Pt.2): 1976	Flameproof electric lighting fittings: Part-2 Fittings using glass tubes.
IS 2206 (Pt.3): 1989	Flameproof electric lighting fittings: Part-3 Fittings using plastic tubes (Group-1 only).
IS 3287: 1965	Industrial lighting fittings with plastic reflectors.
IS 3528: 1966	Waterproof electric lighting fittings
IS 3553: 1966	Waterproof electric lighting fittings
IS 3646 (Pt.1) : 1992	Code of practice for interior illumination: Part-1 General requirements and recommendations for welding interiors (first revision).
IS 3646 (Pt.2): 1966	Code of practice for interior illumination: Part-2 Schedule of illumination and glare index.
IS 3646 (Pt.3): 1968	Code of practice for interior illumination: Part-3 Calculation of coefficients of utilization by the BZ method.
IS 3528: 1966	Specifications for Waterproof lighting fittings.
IS 5216 (Pt.1): 1982	Recommendation on safety procedures we practice in Electrical Work.
IS 4012: 1967	Dust-proof electric lighting fittings.
IS 4013: 1967	Dust-proof electric lighting fittings.
IS 4347: 1967	Code of practice for hospital lighting.
IS 5077: 1969	Decorative lighting outfits
IS 6665: 1972	Code of practice for Industrial lighting.
IS 7537: 1974	Road traffic signals
IS 7569: 1987	Cast acrylic sheets for use in luminaries (first revision)

IS 7678: 1975	Method of photometric testing of incandescent type luminaries for general lighting service.
IS 7785 (Pt.1): 1975	Elevated type aerodrome lighting fittings: Part-1 General requirements
IS 8224: 1976	Electric lighting fittings for division 2 areas.
IS 9583: 1981	Emergency lighting units.
IS 10322 (Pt.1): 1982	Luminaries: Part-1 General requirements.
IS 10322 (Pt.2): 1982	Luminaries: Part-2 Constructional requirements.
IS 10322 (Pt.3): 1984	Luminaries: Part-3 Screw and screw less terminals (superseding IS: 6505)
IS 10322 (Pt.4): 1984	Luminaries: Part-4 Methods of tests.
IS 10322 (Pt.5/Sec1): 1985	Luminaries: Part-5 Particular requirements, Section-1 General purpose luminaries.
IS 10322 (Pt.5/Sec2): 1985	Luminaries: Part-5 Particular requirements, Section-2 Recessed luminaries.
IS 4648: 1968	Guide for Electrical layout in Residential Buildings.
IS 6616	Ballast for mercury vapour lamp.
IS 9900 (Pt.1&2)	HPMV requirements, test and standard lamp Data Sheet.
IS 2418	Tubular flourescent lamps
IS 1534: 1977	Ballast for use in flourescent lighting fittings.
IS 1569: 1976	Capacitors for use in FL, HPMV & LPSV lamp circuits.
IS 9974: 1981	High pressure sodium vapour lamps
IS 9583: 1981	Emergency light units.

3.0 LIGHTING FIXTURES AND ACCESSORIES

3.1.0 Lighting Fixtures / Luminaries – General Requirements

3.1.1 Luminaries shall be designed for continuous trouble-free operation under atmospheric conditions without reduction in lamp life or without deterioration of materials and internal wiring. Outdoor fittings shall be weatherproof and waterproof type.

3.1.2 All luminaries shall be supplied complete with lamps suitable for operation on a normal supply voltage and the variation in supply voltage and frequency indicated in data sheet.

3.1.3 Fluorescent type, sodium vapour and metal halide type luminaries shall be complete with accessories like lamps, ballasts, power factor improvement capacitors, starters etc. These shall be mounted as far as possible in the Luminaire housing only. If these cannot be accommodated integral with the Luminaire then a separate metal enclosed control gear box shall be included to accommodate the control accessories together with a terminal

block suitable for loop-in, loop-out connections. Outdoor type fixtures shall be provided with outdoor type weatherproof box with IP 55 or better.

3.1.4 Fluorescent type luminaries with more than one lamp shall be provided with capacitors connected in lead-lag circuit for correction of stroboscopic effect.

3.1.5 Each Luminaire shall have a terminal block suitable for loop-in, loop-out and T-off connection by 1100 V grade, 1 core, PVC insulated copper conductor wires upto 4 sq.mm in size. In outdoor, areas the termination at the luminaire shall be suitable for 1100V grade, PVC insulated, copper / aluminium conductor, armoured cables of sizes upto 6 sq.mm conductor. Terminals shall be of stud or clamp type. The internal wiring should be completed by the Manufacturer by means of stranded copper wire of minimum 1 sq.mm size and terminated on the terminal block. Terminal blocks shall be mounted with minimum two fixing screws.

3.1.6 Mounting facility and conduit knockouts for the luminaries shall be provided.

3.1.7 All hardware used in the Luminaire shall be suitably plated or anodized and passivated for use in chemical, industrial and power plants.

3.1.8 Earthing

(a) Each Luminaire and control gearbox shall be provided with an earthing terminal suitable for connection earthing conductor as indicated.

(b) Painting / Finish

(c) All surfaces of the Luminaire / control gearbox housing accessories shall be thoroughly cleaned and degreased. It shall be free from scale, rust, sharp edges and burrs.

(d) The finish of the Luminaire shall be such that no bright spots are produced either by direct light source or by reflection.

(e) External control gearbox provided for housing accessories shall be galvanized.

4.0 DECORATIVE LUMINAIRES

4.1.0 Fluorescent Luminaries

4.1.1 These luminaries shall be generally indoor type provided with cold rolled cold annealed (CRCA) sheet steel channel / rail cum reflector housing complete with all electrical control accessories mounted on it. The finish shall be stove enameled.

4.1.2 Decorative fluorescent type luminaires shall be either open type, provided with translucent white opal acrylic diffusers, polystyrene lens prismatic or square polystyrene louvers/Diffusers.

4.1.3 Luminaires shall be suitable for the number of lamps of specified wattage, direct mounting on ceiling / wall/ column pendant mounting or for recess mounting in false ceiling.

4.1.4 Decorative luminaires with mirror optic reflectors shall be made with reflectors with a high specular reflectivity (of more than 90%) and wide-angle dispersion type. Where these luminaires are mounted in control rooms and computer rooms, special type of anti-glare mirror (CAT-2) system shall be provided to direct the light output in the desired direction. This is mainly to reduce reflection of the light source from computer screens.

4.1.5 Luminaires mounted recessed in false ceiling shall be with reflector housing and spring loaded fixing arrangement for the diffuser / louver frame. It shall be possible to have access to the lamp and other accessories from below.

4.2 Incandescent / Mercury Vapour / Sodium Vapour / Metal Halide Luminaires

4.2.1 Decorative luminaires with sodium vapour lamp / metal halide shall be generally outdoor weather proof type with degree of protection IP 55 suitable for conduit mounting.

4.2.2 The luminaire may be provided with integral mounted control accessories or with external mounted control gearbox.

4.2.3 Decorative lantern luminaires shall be outdoor weather proof type with degree of protection IP 55, cast aluminium, stove enameled housing, prismatic heat resistant, toughened glass cover complete with neoprene gaskets, top or side conduit entry and integral mounted control gear box.

5.0 BULK HEAD LUMINAIRE

5.1 The luminaire shall be robust construction, cast aluminium / vitreous enameled housing, heat and shock resistant prismatic or clear glass cover fixed with neoprene gaskets for sealing. For mechanical protection to the glass cover, round steel wire guard with vitreous enamelled finish shall be provided. The Luminaire shall be suitable for incandescent lamp upto 150 watts or 13 watts CFL, for direct mounting to ceiling / wall / column and is used for general-purpose indoor lighting.

6.0 FLOOD LIGHT LUMINAIRE

6.1 General purpose flood light Luminaire

6.1.1 Flood light luminaires shall be of weather proof construction with cast aluminium housing, anodized aluminium mirror polished reflector, heat resistant, toughened glass cover and necessary neoprene gaskets to prevent ingress of dust, moisture and insect.

6.1.2 The housing shall be supported on a cast iron / aluminium base and capable of being swiveled in both horizontal and vertical directions and locked in any desired position.

6.1.3 For focusing purposes, knobs shall be provided along with sector plate indicating the angle in degrees between 0 and 90 deg. in vertical direction.

6.1.4 The luminaires shall be suitable for halogen lamps upto 1000 watts, metal halide lamps of 2000 W. When metal halide lamps are specified, the same shall be mounted in a separate sheet metal enclosed / cast aluminium weatherproof control gearbox.

7.0 OUTDOORS LUMINAIRES

7.1 Street Lighting Luminaires

7.1.1 Mercury vapour and sodium vapour luminaire.

7.1.2 Street light sodium vapour luminaires shall be outdoor weather proof type for illumination of main roads, etc.

7.1.3 The luminaire shall be of semi-cut off or cut-off type, with cast aluminium housing, acrylic or prismatic cover, polished aluminium reflectors, complete with integral mounted control gear, neoprene gaskets and with rear pipe entry.

7.1.4 The luminaires shall be suitable upto 250 watts mercury or sodium vapour lamps.

7.2 Post Top Lantern

7.2.1 Post top lantern luminaires shall be generally outdoor weatherproof type for illumination of walkways, gateposts, gardens etc.

7.2.2 The luminaire shall have cast aluminium spigot finished with corrosion proof paint for mounting, opal acrylic or high density polyethylene (HDP) diffuser bowl, complete with integral mounted control gear, neoprene gaskets, earthing terminal etc.

7.2.3 The luminaire shall be suitable upto 200 W incandescent lamp , 125 W mercury vapour lamp or 70 W sodium vapour lamp.

7.4 Environmental Lighting Luminaires

7.4.1 Bollard Luminaire

a) Bollard luminaire shall be outdoor, weatherproof type for illumination of lawns, gardens, pathways etc.

b) The luminaire shall be of FRP housing, clear acrylic cover, louvres for directing light downward and bottom cable entry.

c) The luminaire shall be suitable for 60 watts incandescent lamp, 9/11/13/18 W PL/CFL

8.0 ACCESSORIES FOR LUMINAIRES

8.1 Reflectors

8.1.1 The reflectors shall be made of CRCA sheet steel / aluminium / silvered glass/ chromium plated sheet copper as indicated for above mentioned luminaires.

8.1.2 Thickness of steel / aluminium shall comply with relevant standards specified in Data Sheet. Reflectors made of steel shall have stove enamelled / vitreous enamelled / epoxy coating finish. Aluminium used for reflectors shall be anodized / epoxy stove enamelled / mirror polished. The finish for the reflector shall be as indicated for above-mentioned fittings and or in Data Sheet.

8.1.3 Reflectors shall be readily removable from the housing for cleaning and maintenance without disturbing the lamps and without the use of tools. They shall be securely fixed to the housing by means of positive fastening device of captive type.

8.2 Lamp / Starter Holders

8.2.1 Lamp holders shall comply with relevant standards specified in Data Sheet. They shall have low contact resistance, shall be resistant to wear and shall be suitable for operation at the specified temperature without deterioration in insulation value. They shall hold the lamps in position under normal condition of shock and vibration met with under normal installation and use.

8.3 Ballasts

8.3.1 Ballasts shall be designed manufactured and supplied in accordance with the relevant standards specified in Data Sheet and as per BOQ. The ballasts shall be designed to have a long service life and low power loss.

8.3.2 Ballasts shall be of the inductive, heavyduty type copper wire wound, filled with thermosetting, insulating, moisture repellent polyester compound filled under pressure or vacuum. Ballasts shall be provided with taps to set the voltage within the range specified in enclosed Data Sheet. End connections and taps shall be brought out to a suitable terminal block rigidly fixed to the ballast enclosure. Ballasts shall be free from hum and such of those which produce hum shall be replaced by Vendor with free of cost.

8.3.3 Separate ballast for each lamp shall be provided in case of multi lamp luminaires, except in the case of 2 x 20 watts luminaires.

8.3.4 Electronic Ballast

Electronic ballast shall be suitable for fluorescent / compact fluorescent lamp and shall be energy saving, warm start type having a power factor better than 0.96, having an optimum wattage delivery to the lamp. The choke shall be suitable for 180 – 270 V AC for operation at ambient temperature range of -15ºC to +50ºC. The choke shall have low radiated and conducted EMI / RFI. Refer BOQ

8.4 Starters

8.4.1 Starters shall have bimetal electrodes and high mechanical strength. Starters shall be replaceable without disturbing the reflector or lamps and without the use of any tool. Starters shall have brass contacts and radio interference capacitors.

8.4.2 The starters shall generally conform to the relevant standards specified in Data Sheet.

8.5 Capacitors

8.5.1 Capacitors shall have a constant value of capacitance and shall be connected across the supply of individual lamp circuits.

8.5.2 Capacitors shall be suitable for operation at supply voltage and shall have a value of capacitance so as to correct the power factor of its corresponding lamp circuit to the extent of 0.95 lags or better.

8.5.3 Capacitors shall be hermetically sealed preferably in a metal enclosure to prevent seepage of impregnant and ingress of moisture.

8.6 Lamps

Lamps shall be capable of withstanding small vibrations and the connections at lead in wires and filaments / electrodes shall not break under such circumstances.
Lamps / tubes shall conform to relevant standards specified in Data Sheet.

8.6.1 Incandescent lamps

(a) General lighting service (GLS) lamps shall be tungsten filament incandescent type. The filament shall be coiled coil type rated for 230 / 250 volts, single phase AC.

8.6.2 Halogen Lamps

a) Halogen lamps shall be tungsten halogen type suitable for fitment in flood light luminaires.

b) Lamps shall be rated 250 volts single-phase AC upto 1000 watts.

8.6.3 Gas Discharge Lamps

8.6.3.1 Fluorescent Lamps

a) Fluorescent lamp luminaries shall be with TRULITE lamps, low wattage consumption, high efficiency and longer burning life (about 10000 hours).

b) Lamps shall be of warm white or cool day light type with triband phosphor coated type, suitable for operation on 240V, single phase AC, in standard lengths of 2 and 4 feet.

c) Lamp colour shall be colour-82 for lift lobby and colour 86 for all other areas.

8.6.3.2 Compact Fluorescent Lamps

a) These compact fluorescent lamps shall be of low pressure, low wattage type with integral glow switch starter with separate/inbuilt ballast. Suitable for operation on 240 V, single phase AC with burning life (about 10000 hours).

b) Lamps shall be rated 9 W, 11 W, 13W, 18W, for compact fluorescent (PL) type.

c) Lamp colour shall be colour-82 for lift lobby and colour 86 for all other areas.

9.0 LED LUMINAIRES

The LED luminaires shall be of the types specified in the drawings. They shall be Suitable for surface / ceiling recess / floor recess mounting as required. The degree of protection for floor recess mounting LED luminaire shall not be less than IP 65.The power of LED shall be as specified.

The with LED lamp and suitable electronic power supply.

The electronic power supply shall be with 12V DC, 15V DC or 24V DC output as required. The LED shall have long life of not less than 50,000 burning hours.

The colour of lamp shall be as specified in the drawing. The beam angle in case of LED spotlights shall be as specified.

10.0 Installation of Luminaries

10.1 General

All screws, battens, roses, trims, packing, etc., necessary for the proper fixing of luminaries shall be provided by the Contractor as part of the works. Packing pieces of approved material shall be fitted where required to level the luminaries and to prevent distortion.

Where painted surfaces are damaged, they shall be made good by painting to the same standard as the original paintwork.

Fittings are to be installed subject to the approval of the Consultant / Client
All luminaries shall be effectively earthed.

Where rod suspensions are indicated, rods shall be steel water pipe. Rods shall be gimbal mounted from ceiling and lengths shall be adjusted so that the luminaries hang true.

10.2 Surface Mounted Luminaries

Luminaries shall be securely fixed to structural members of the ceilings or walls, or fixed by hangers or brackets, which are securely fixed to structural members.

The minimum size of fixing for luminaries, hangers, or brackets for various surfaces shall be as follows:

(a) Fixing to timber: steel wood screw No.10 x 25, round head, cadmium plated.

(b) Fixing to concrete: approved screw expanding bolts M5 x 40.

(c) Fixing to hollow blocks: M5 electro-galvanized, round head screws with spring loaded butterfly toggles. Where a deep cast iron junction box is provided in the centre, M5 metal screws shall be used with approved expanding fixings at each end.

(d) Fixing to suspended ceilings shall be as indicated.

All fixings shall be fitted with large diameter (minimum 3 mm screw dia.) cadmium plated washers under the heads of each screw.

10.3 Recessed Luminaries

Recessed luminaries shall be fitted with flexible cords and 3 pin plugs. The flexible cord shall be PVC insulated, 3 core with 1.5 mm 2 conductors, and shall comply with the relevant IS. It shall be of suitable length not greater than 1500 mm.

A plug socket shall be located within 500 mm from the edge of the access aperture to allow the luminary to be plugged-in prior to fixing.

Recessed luminaries installed in timber-framed ceiling shall be fixed to the ceiling members and noggins using the proprietary fixings supplied by the luminary manufacturer, subject to the approval of the Consultant / Developer.

Recessed luminaries for suspended or modular ceilings shall be attached to suspended ceilings with proprietary mounting brackets supplied by the luminary manufacturer.

EARTHING PROTECTION SYSTEMS – INSTALLATION NOTES

1.0 GENERAL

1.1 These notes shall be read and considered in conjunction with earthing drawings and specification. In case of any conflict between these notes and drawings/ specification, the later shall prevail.

1.2 Earthing protection system layouts are diagrammatic only. Exact location of earthing protection conductors, earth electrodes and test pits and connection may be changed to suit the site conditions. Major modification should be referred to EMPLOYER for clearance.

1.3 Neutral point of the system of the different voltages, metallic enclosures and frameworks associated with all current carrying equipment and extraneous metal works associated with electric system shall be connected to a single earthing system unless stipulated otherwise.

1.3 Earthing protection system installation shall be in strict accordance with the latest editions of Indian Electricity Rules, Relevant Indian Standards and codes of practice and Regulations existing in the locality where the system is installed.

i) Code of practice for Earthing : IS: 3043
ii) Guide for safety in AC substation grounding : IEEE: 80
iii) Indian Electricity rules 1956.

2.0 EARTHING CONDUCTOR LAYOUT

1.1 Earthing conductor in outdoor area shall be buried at least 600mm below finished floor level unless stated otherwise.

1.2 The spacing between adjacent rod / pipe electrode shall be twice the length of the electrode, unless otherwise stated elsewhere. The spacing between adjacent plate electrodes shall be as per the drawings, unless otherwise stipulated otherwise.

1.3 Earthing conductor around the building shall be buried in earth minimum distance of 1500mm fro the outer boundary of the building.

1.4 Earthing conductors embedded in the concrete floor of the building shall have at least 50mm concrete cover.

1.5 Earthing conductor along their run on the columns, walls, etc., shall be fixed by suitable welding or cleating at intervals of 1000mm and 750mm respectively.

1.6 Tap connections from the floor-earthing grid to the equipment / structure to be

earthed shall be terminated on the earthing terminals of the equipment, if the equipment is available at the time of laying the grid. Otherwise “earth raiser “ or “earthing pads” shall be provided near the equipment foundation / pedestal for future connection to the equipment earthing terminals.

2.7 In outdoor areas, buried conductors shall be brought 500mm above the ground level for making tap connections to the equipment (above ground level)

1.7 Earthing conductors crossing the road shall be either installed in Hume pipes are laid at greater depths to suit the site conditions.

1.8 Wherever earthing conductor cross underground service ducts, pipes, trenches, tunnels, railway tracks etc., it shall be laid in Hume pipes and minimum 300mm below them. The earthing conductor shall be re-routed in case it fouls with equipment foundation.

1.9 Wherever earthing conductor passes through walls, floors etc., galvanized conduit / HDPE pipe sleeves shall be provided for the passage of the conductor. Both ends of the sleeve shall be sealed to prevent the passage of water through the sleeves. The seals in addition shall be fire proof if the specification / project drawings call for the same.

1.10 Water stops shall be provided wherever earthing conductors enters the building from outside, below the ground level.

1.11 Separate / isolated earthing system, if required, shall be provided for instrumentation and control and control systems in the plant, including dedicated earth pits.

3.0 EQUIPMENT EARTHING

3.1 Earthing pads / terminals will be provided by the manufacturer of the apparatus/ equipment at accessible positions. The connection between the earthing pads/ terminals and earthing grids shall be made by short and direct earthing leads free from kinks and splices.

3.2 Steel / RCC columns, metallic stairs, Hand rails, Cable trays, metallic conduits, and pipes etc. shall not be used as earth continuity conductor.

3.3 A separate earthing conductor shall be provided for earthing lighting fixtures, receptacles, switches, junction boxes, lighting conduits, poles etc. This conductor in turn shall be connected to the main earth. These details are covered separately under lighting installation notes and details, which shall apply.

3.4 Whenever earthing conductor crosses or runs at less than 300mm distance along metallic structures such as gas, water, steam pipes, conduits etc., and steel reinforcement in concrete, it shall be bonded to the same. In case earthing connection to pipe and conduit etc. at a distance higher than 300mm is required, the same shall be marked on the drawing.

3.7 Miscellaneous items such as junction boxes, field switches, cable end boxes/ glands, fitting and fixture shall be earthed whether specifically show or not.

3.8 In general minimum two earth leads shall be used for earthing each equipment / structure enclosing the power conductor operating at more than 250V and one earth lead if the voltage level is 250V or less.

4.0 JOINTING

3.1 Earthing connections to equipment earthing pads / terminals shall be bolted type with GI bolts and nuts. Contact surfaces shall be free from scale, paint, enamel, grease, rust or dirt. Two bolts (min.) shall be provided for making each connection. Equipment bolted connections, after being checked and tested, shall be painted with anti corrosive paint/ compound.

3.2 Connection between equipment earthing lead and main earthing conductors and between main earthing conductors shall be welded / brazed type. For rust protection the welds shall be treated with red lead and afterwards thickly coated with bitumen compound to prevent corrosion.

3.3 Steel to copper, copper to copper connections should be brazed type. Welding shall be adopted in case of steel. Welding to be done as per IS: 816.

3.4 The jointing whether welded, brazed of bolted shall be such that the resistance of the joint is not more than the resistance of the equivalent length of the conductor.

3.5 Welding / Brazing surfaces shall be cleaned and made free of all oxide films, grease, oil or any foreign material. However, the joining surfaces should not be made too smooth / highly polished, to prevent the joining material from flowing away.

4.6 All brazing should be done by oxy- acetylene torch flame.

3.6 All welded connections shall be made by electric arc welding. All welded joints shall be allowed to cool down gradually to atmospheric temperature before putting any load on it. Artificial cooling shall not be allowed.

3.7 Bending of large diameter rod / thick conductors shall be done preferably by gas heating.

3.8 All arcs welding with large diameter conductor shall be done with low hydrogen content electrodes.

3.9 For brazing alloys of silicon bronze/ phosphor or copper/ phosphor-silver-copper shall be used.

5.0 CABLE EARTHING

5.1 Metallic sheaths, screens and armour of all multicore power/ control cables shall be earthed at both equipment and source / switchgear end. Sheath and armour of single core power cables shall be earthed at source /switchgear end only, unless otherwise stated elsewhere.

6.0 SPECIFIC REQUIREMENTS FOR EARTHING SYSTEM

6.1 Make a bore of 8-10 inch dia up to the suitable depth to install electrode of required length. Fill the space between electrode and soil with specially developed BFC mixed with water. Continue till pits shall filled up to the neck of electrode. After installation pour a few buckets of water around electrode for few days.

6.2 The electrode while installation shall be surrounded by special backfill compound. The Backfill material is a specially developed compound, which shall be capable of absorbing and retaining the moisture for a long time. It shall be low solubility and low resistivity (Approximately 5-50Ohm-meter in a saturated solution). It shall be virtually neutral, having a pH value of between 6.2 and 6.9

7.0 GENERAL REQUIREMENTS

All non-current carrying metal parts of the electrical installation shall be earthed as per IS: 3043. All equipment, metal conduits, rising main, cable armour, switch gear, distribution boards, meters, all other metal parts forming part of the work shall be bonded together and connected by two separate and distinct conductors to earth electrodes. Earthing shall be in conformity with the provisions of Rules 32, 61, 62, 67 and 68 of IER 1956.

Complete earthing system comprising earth electrodes in conjunction with earth grid shall be provided for the substation and control room for achieving a safe step and touch potential.

7.1 STANDARDS

Code of Practice for earthing : IS 3043
Indian Electricity Rules : 1956
Indian Electricity Act : 1910
CEIG Regulations. : Latest rev

7.2 DETAILS OF EARTHING SYSTEM

Unless otherwise specified main earthing shall not be less than 50x6mm GI flat.
Equipment to Main Grid - 25 x 6mm GI Flat
DBs / Junction Boxes - 8SWG GI Wire

8.0 EARTHING

8.1 PIPE ELECTRODE

Pipe electrode shall be made of CI (cast iron) pipe, 13mm thick of internal diameter of 100mm. The pipe electrode shall, as far as practicable, be embedded below permanent moisture level. The length of the pipe electrode shall not be less than 2.5 M. It shall have 12mm dia. through holes drilled at 300mm spacing all along its length. Except where rock is encountered, pipes shall be driven to a depth of at least 2.5 M. Where rock is encountered at a depth of less than 2.5 M, the electrode may be buried inclined to the vertical and the inclination shall be not more than 30 deg. to the vertical. The pipe electrode shall be made in one piece. 19mm GI pipe for watering shall be terminated in a GI wire meshed funnel

Suitable funnel arrangements shall be made at the mouth of the pipe for watering.

A suitable plate shall be fixed on to the rod for making necessary connections to the earth flat. The electrode shall be enclosed in a concrete earth pit with suitable cast iron / RCC covers. Each earth electrode shall have provision for individually testing the electrode. Coke / Charcoal / Salt shall be used to achieve the necessary earth resistance. Earth electrodes shall be erected 1.5 Mts. away from the building edge and minimum spacing between the electrodes shall be maintained as per IS: 3043

8.2 PLATE ELECTRODE

Plate electrode shall be made of COPPER (Cu) plate of 3mm thick and 600 x 600 mm size. The plate shall be buried vertically in ground at a depth of not less than 2.5 M to the top of the plate, the plate being encased in charcoal to a thickness of 300 mm all round. It is preferable to bury the electrode to a depth where subsoil water is present. A GI pipe of not less than 19mm dia shall be clamped with bolts vertically to the plate and terminated in a wire meshed funnel.

Suitable funnel arrangements shall be made at the mouth of the pipe for watering.

A suitable plate shall be fixed on to the rod for making necessary connections to the earth flat. The electrode shall be enclosed in a concrete earth pit with suitable cast iron / RCC covers. Each earth electrode shall have provision for individually testing the electrode.

Coke / Charcoal / Salt shall be used to achieve the necessary earth resistance.

Earth electrodes shall be erected 1.5 Mts. away from the building edge and minimum spacing between the electrodes shall be maintained as per IS: 3043.

9.0 CONSTRUCTION DETAILS OF EARTH STATION

The funnel over the pipe / plate earth station shall be enclosed in a masonry chamber of 600 x 600 mm dimensions. The chamber shall be provided with CI frame and CI inspection cover. The earth station shall also be provided with a suitable permanent identification label/ tag. The earth electrode shall conform to IS: 3043 latest edition. The soil around the earthing electrode shall be treated to reduce the resistivity of the soil by filling the complete depth of electrode with a mixture of charcoal, salt and sifted earth.

10.0 FORMATION OF EARTHMAT

The formation of Earth mat consists of constructing a Grid of 50 x 6 /25 x 3 mm GI strips and for copper mat 50 x 6 On the periphery and All members and overlaps shall be welded. The whole mat shall be located at a depth of 1.5 M from F F l and the complete mat shall be connected to two Earth stations within the mat. (the earth station details are as above) These Earth stations shall be of Plate type Electrode with 200 mm Bentonite clay forming the first layer on which the Electrode rests, subsequently, Salt, Charcoal & Sand shall be filled. Lastly the excavated earth shall form the final Layer.

11.0 EARTHING CONDUCTORS

All earthing conductors shall be of high conductivity copper or hot dipped GI.
Copper tape shall be protected against mechanical damage and corrosion.
Copper tape shall be connected to the plate electrode with brass bolts, nuts and washers; hot dipped GI flats shall be laid directly buried and connected to electrode by means of GI

bolts set. Earthing conductors shall be terminated at the equipment using suitable lugs, bolts, washers and nuts.

The connection of earth electrodes shall be strong, secure and sound and shall be easily accessible. The earth conductors shall be rigidly fixed to the walls, cable trenches, cable tunnel, conduits and cables by using suitable clamps.

Main earth bus shall be taken from the main medium voltage panel to the earth electrodes. The number of electrodes required shall be arrived at taking into consideration the anticipated fault on the medium voltage net work.

Earthing conductors for equipment shall be run from the exposed metal surface of the equipment & connected to a suitable point on the sub main or main earthing bus. All switch boards, distribution boards and isolators, disconnect switches shall be connected to the earth bus. All conduits/ cable armouring etc., shall be connected to the earth all along their run by earthing conductors of suitable cross sectional area. The electrical resistance of earthing conductors shall be low enough to permit the passage of fault current necessary to operate a fuse/ protective device such as a circuit breaker and shall not exceed 2 ohms.

Earthing conductors in outdoor areas shall be buried atleast 600mm below finished grade level unless stated otherwise.

Wherever earthing conductors cross cable trenches, underground service ducts, pipes, tunnels, etc. it shall be laid minimum 300 mm below and shall be re-routed in case it fouls with equipment structure foundations. Earthing conductor around the building shall be buried in earth at a minimum distance of 500 mm from the outer boundary of the building.

Tap-connections from the earthing grid to the equipment/structure to be earthed shall be terminated on earthing terminals of the equipment/structure, if the equipment is available at the time of laying the grid, otherwise "earth riser" shall be provided near the equipment foundation/ pedestal for future connections to the equipment earthing terminals. Earthing conductors along their run on cable trench ladder columns, beams, walls, etc. shall be supported by suitable cleating at intervals of 750 mm. Earthing conductors along cable trenches shall be cleated to the wall nearer to the equipment.

Cable trays and supports shall be connected to the earth mat at every 30 meters interval. Wherever it passes through walls, floors, etc. GI sleeves shall be provided for the passage of the conductor.

11.1 Copper bonded Steel Earth Rods:

Copper bonded Steel Earth Rods shall have the UL certification, which calls for a minimum molecular bonding of 250 microns. These Coppers bonded rods are provided with a Nickel bonding interface to avoid galvanic corrosion.

11.2 JOINTS & PRECAUTIONS

Earthing system shall be mechanically robust and the joints shall be capable of retaining low resistance even after repeated subjections to fault currents.

Joints shall be tinned (if copper) and brazed / welded, double bolted / rivetted. All the joints shall be mechanically and electrically continuous and effective. Joints shall be protected against corrosion.

12.0 EQUIPMENT EARTHING

All electrical power items shall be earthed by two separate and distinct earth connections from main earth bus.

Earthing pads shall be provided by the supplier of the apparatus/equipment at accessible position. The connection between earthing pads and the earthing grid shall be made by short and direct earthing lead free from kinks and splices. In case earthing pads are not provided on the item to be earthed, same shall be provided in consultation with Engineer-in-Charge.

Metallic conduits shall not be used as earth continuity conductor.
Wherever earthing conductor crosses or runs along metallic structures such as gas, water, steam, conduits, pipes etc. and steel reinforcement in concrete, it shall be bonded to the same.

Cable end boxes, glands, etc. shall be connected to the earthing conductor running along with the supply cable which, in turn, shall be connected to earthing grid conductor at minimum two points.

The metallic screens of the single core cable, shall be connected to earth at one end only.

14.0 EARTHING PROTECTION SYSTEMS – INSTALLATION

14.1 GENERAL

These notes shall be read and considered in conjunction with earthing drawings and specification. Incase of any conflict between these notes and drawings/ specification, the later shall prevail.

Earthing protection system layouts are diagrammatic only. Exact location of earthing protection conductors, earth electrodes and test pits and connection may be changed to suit the site conditions. Major modification should be referred to EMPLOYER for clearance.

Neutral point of the system of the different voltages, metallic enclosures and frameworks associated with all current carrying equipment and extraneous metal works associated with electric system shall be connected to a single earthing system unless stipulated otherwise.

Earthing protection system installation shall be in strict accordance with the latest editions of Indian Electricity Rules, Relevant Indian Standards and codes of practice and Regulations existing in the locality where the system is installed.

- Code of practice for Earthing IS: 3043
- Guide for safety in AC substation grounding IEEE: 80
- Indian Electricity rules 1956.

14.2 EARTHING CONDUCTOR LAYOUT

Earthing conductor in outdoor area shall be buried at least 600mm below

finished floor level unless stated otherwise.

The spacing between adjacent rod / pipe electrode shall be twice the length of the electrode, unless otherwise stated elsewhere. The spacing between adjacent plate electrodes shall be as per the drawings, unless otherwise stipulated otherwise.
Earthing conductor around the building shall be buried in earth minimum distance of 1500mm fro the outer boundary of the building.

Earthing conductors embedded in the concrete floor of the building shall have at least 50mm concrete cover.

Earthing conductor along their run on the columns, walls, etc., shall be fixed by suitable welding or cleating at intervals of 1000mm and 750mm respectively.

Tap connections from the floor-earthing grid to the equipment / structure to be earthed shall be terminated on the earthing terminals of the equipment, if the equipment is available at the time of laying the grid. Otherwise “earth raiser “ or “earthing pads” shall be provided near the equipment foundation / pedestal for future connection to the equipment earthing terminals.

In outdoor areas, buried conductors shall be brought 500mm above the ground level for making tap connections to the equipment (above ground level)

Earthing conductors crossing the road shall be either installed in Hume pipes are laid at greater depths to suit the site conditions.

Wherever earthing conductor cross underground service ducts, pipes, trenches, tunnels, railway tracks etc., it shall be laid in Hume pipes and minimum 300mm below them. The earthing conductor shall be re-routed in case it fouls with equipment foundation.

Wherever earthing conductor passes through walls, floors etc., galvanized conduit / HDPE pipe sleeves shall be provided for the passage of the conductor. Both ends of the sleeve shall be sealed to prevent the passage of water through the sleeves. The seals in addition shall be fire proof if the specification / project drawings call for the same.

Water stops shall be provided wherever earthing conductors enters the building from outside, below the ground level.

Separate / isolated earthing system, if required, shall be provided for instrumentation and control and control systems in the plant, including dedicated earth pits.

15. SAFETY CODE

1. The contractor shall maintain in a readily accessible place first aid appliances including adequate supply of sterilized dressings and cotton wool.

2. An injured person shall be taken to a private/public hospital without loss of time, in cases where the injury Necessities hospitalization.

3. Suitable and strong scaffolds should be provided for workmen for all works that cannot safety be done from ground.

4. No portable single ladder shall be over 8 meters in length. The width between the side rails shall not be less than 30cm clear and the distance between two adjacent rungs shall not be more than 30cm. When a ladder is used and extra mazdoor shall be engaged for holding the ladder.

5. The excavated material shall not be placed within 1.5 meters of the edge of the trench or half of the depth of trench whichever is more. All trenches and excavations shall be provided with necessary fencing and lighting.

6. Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be one meter.

7. No floor, roof or other part of the structure shall be over loaded with debris or materials as to render it unsafe.

8. Those engaged in welding works shall be provided with welder's protective eye shields and gloves.

9. Hoisting machine and tackle used in the works, including their attachments anchorage and supports shall be in perfect condition.

10. The ropes used in hoisting or lowering material or as a means of suspension shall be or durable quality and adequate strength and free from defects.

11. The consultants / employer reserves the right to instruct the contractors to take additional safety precautions if found necessary.

12. All temporary power sockets at the work stations must be controlled with RCCB (30ma) with suitable current rating.

Recommended Make of Materials-Electrical

FRLS LT Cables	Polycab / Havells / KEI
LT End Termination	Dowell's / HMI/Bracom / Polycab
Battery Charger	Dubas/Universal/Nuetech
SMF Batteries	Exide / Amaron/Amaraja/Rocket
Fault relays	Prok dv's / L&T / C&S
Indicating Meters (Electronic)	Conzerve / Elmeasure / Selec
Indicating Lamps	Salzer / L&T
Low Voltage Monitor	L&T / Prok Dv's
Selector Switch & Push Buttons	L&T / Salzer / Technic
Power Contactors	ABB / L&T / C&S
Change over switch	C&S / ABB/ L&T / HPL
Isolator	ABB / Schneider
Instrument Transformers	Kappa / Kalpa /Pragati / AE
Protection Relays	ABB / L&T / Schneider/Prok Dv's
FRLS PVC Conduits	VIP / National / Universal
FRLS PVC Wires	Havells / Polycab/ KEI /RR CABLE
LT Panel Fabrication .	Star power controls / Imperial electro panel builder / Nidhi controls
Capacitor Control Relay	Ducati / Epcos / Neptune /L&T
Capacitors	Epcos / Ducati / Neptune/L&T
Cable Tray	Profab / OBO /Pushpak
Floor Raceways	Legrand / Pushpak /OBO equivalent
Light Fixtures	Wipro / Havells / Jaquar
Industrial Sockets	Hensel / Neptune/ Schneider/ Polycab
Marshaling Box for street lights	Hensel / Legrand / Spelsberg
Multi Data Meter	Conzerve / Elmeasure

MCB/MDB/ELCB/RCCB/RCBO	ABB / Schneider /Legrand/Havells
Distribution Boards	ABB / Schneider /Legrand/Havells
Switch Sockets	Norisys / Legrand Myrius / Polycab
Data, Telephone & TV Outlets	Norisys / Legrand Myrius
HDMI,VGA&USB outlets	Legrand Myrius / Commoscope
HDMI Cable	D-link / vention /Honeywell
VGA & USB Cable	D-link / vention /Honeywell
MS Conduit	Bharath / GB/Jindal
GI Pipe	Tata / Jindal
Chemical Earthing	Ashlok / Indelec / Galaxy
Earth Strips	Indelec/Gravin
48/24 Port Jack panel	Comscope / Legrand
MDF krone junction box	Krone / Equivalent
LED HD display	Sony/Samsung/LG
VOICE / DATA FACE PLATES & RJ 45	SYSTIMAX / LUCENT – AVAYA/ AMP
CAT-6 VOICE / DATA CABLES	SYSTIMAX / LUCENT – AVAYA/ AMP
TELEPHONE CABLES	DELTON/ SKYTONE
VIDEO EQUIPMENT RACK	WALLRACK/VERTIV/RITTAL
NVR	NORDAN/ HikVision
CAMERAS	NORDAN/ HikVision
CCTV SYSETM	NORDAN/ HikVision

CHAPTER - C: PHE, SANITARY AND WATER SUPPLY SYSTEM

SPECIAL CONDITIONS

1. GENERAL

These special conditions are intended to amplify the General Conditions of Contract and shall be read in conjunction with the same. For any discrepancies between the General Conditions and these Special Conditions, the more stringent shall apply.

2. SCOPE OF WORK

The general character and the scope of work to be carried out under this contract is illustrated in Drawings, Specifications and Bill of Quantities. The Contractor shall carry out and complete the said work under the contract in every respect in conformity with the contract documents and with the direction of and to the satisfaction of the BRBNMPL's site representative. The contractor shall furnish all labor, materials and equipment (except those to be supplied by the BRBNMPL) as listed under Bill of quantities and specified otherwise, transportation and incidental necessary for supply installation, testing and commissioning of the complete Sanitary and Water Supply system as described in the Specifications and as shown on the drawings. This also includes any material, equipment, appliances and incidental work not specifically mentioned herein or noted on the Drawings/Documents as being furnished or installed, but which are necessary and customary to be performed under this contract. The Sanitary and Water Supply System shall comprise of follows:

a. Sanitary Fixtures and Fittings

The section consists of but is not necessarily limited to installation, testing and commissioning of following items :

a. Sanitary appliances and fixtures for toilets
b. Chromium plated brass fittings.
c. Stainless steel sinks
d. Accessories e.g. towel rods, toilet paper holders, soap dish, liquid soap dispensers towel rails, coat hooks etc.
e. Hand driers etc.

Whether specifically mentioned or not the Contractor shall provide for all appliances and fixtures all fixing devices, nuts, bolts, screws, hangers as required.

All exposed pipes within toilets and near appliances / fixtures shall be of chromium plated brass or copper unless otherwise specified.

b. Water Supply System

The section comprises the supply, installation, testing and commissioning of piping network for water supply for internal & external services as follows:

a. Borewell / Municipal / Tanker Water supply.
b. Drinking water supply
c. Flushing water supply

d. Washing
e. External water supply to cater for Horticulture and Cooling Towers drawn from the Treated Sewage Water Tank through an independent pumping System (as required).

f. Connection to various mechanical equipments to be supplied and installed by the other specialist contractors

The contractor shall make all necessary application and arrangements for his work to be inspected by the Local authorities.

The Contractor shall be solely responsible for obtaining the Authorities approval of his works prior to the handing over the complete water supply / distribution installation to the BRBNMPL.

1. PIPING MATERIALS

The piping system shall consist of heavy class galvanized iron pipes and fittings conforming to IS: 1239. The piping system shall also consist of CPVC pipes and fittings. The sizes and makes is specified in the Bill of quantities.

For any internal works, the pipes and fittings shall be embedded in the wall chase or run on the floor/ceiling unless otherwise specified. No unsightly exposed runs shall be permitted. Outside the building the piping shall be installed at least 1.0 m below the finished grade level.

c. Internal and External DRAINAGE (SOIL, WASTE, VENT & RAIN WATER PIPES)

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

Work under this section shall consist of furnishing all labour, materials, equipments and appliances necessary and required to completely install all soil, waste, vent and rainwater pipes and fittings as required by the drawings, and given in the Bill of quantities.

Without restricting to the generality of the foregoing the soil, waste, vent and rainwater piping system shall include the following: -

a) Vertical and Horizontal Soil, waste, vent, rain water pipes and fittings, joints, clamps and connections to fixtures.
b) Connection of all pipes to sewer lines as shown on the drawings.
c) Floor traps, cleanout plugs and inlet fittings.

Testing of all pipe lines and all accessories as per Bureau of Indian Standards.

EXTERNAL DRAINAGE(SEWAGE & STORM WATER DISPOSAL)

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

The contractor shall install a drainage system to effectively collect drain and dispose all soil and waste water from various parts of the buildings appurtenances and equipment. The piping system shall finally terminate and discharge into the STP. The piping work mainly

consists of laying of Salt glazed stoneware pipes reinforced cement concrete pipes and cast iron soil pipes as called for on the drawings. All piping shall be installed at depth greater than 80cm below finished ground level. The disposal system shall include construction of gully traps, manholes, intercepting chambers as indicated. The piping system shall be vented suitably at the starting point of all branch drains main drains, the highest / lowest point of drain and at intervals as shown. All ventilating arrangements shall be unobstructive and concealed. The work shall be executed strictly in accordance with IS : 1742. The sewage system shall be subject to smoke test for its soundness as directed by the Project Manager. Wherever the sewerage pipes run above water supply lines same shall be completely encased in cement concrete 1:2:4 all round with the prior approval of the Project Manager.

Without restricting to the generality of the foregoing, the drainage system shall inter-alia include :

a. Sewer lines including earth work for excavation disposal back filling and compaction, pipe lines, manholes, drop connections and connections to the municipal or existing sewer.

b. 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 or connected as indicated by the Project Manager.

3. ASSOCIATED CIVIL WORKS

Following civil works associated with Sanitary and Water Supply installation are excluded from the scope of this contract. These shall be executed by other agencies in accordance with approved shop drawings of and under the direct supervision of the Sanitary and Water Supply contractor.

i. RCC foundation for machines, pumps & large equipment with angle iron frame work at the edges to protect these from damage.
ii. RCC work for water tanks
iii. PCC foundation blocks with angle iron frame work edging for all motor control centre.
iv. Water proofing of floors
v. Masonry drain channels and sumps in plant room.

4. ASSOCIATED SERVICES WORKS

4.1. All associated ELECTRICAL WORKS listed below are excluded from the scope of this contract. These shall be installed by other agencies in accordance with approved shop drawings of, and under direct supervision of the Sanitary and Water Supply contractor.

i. Providing power supply with earthling at the incoming of control panel in plant room

5. DRAWINGS

The contractor shall follow the tender drawings for preparation of his shop drawings, and for subsequent installation work. He shall check the drawings of other trades to verify spaces in which his work will be installed.

Each tendered shall submit along with his tender, the technical data for all items listed in Appendix-IV in the indicated format. Failure to furnish complete technical data with tenders may result in rejection of the tender.

four weeks of approval of all the relevant shop drawings, the contractor shall submit four copies of a comprehensive variation in quantity statement, and itemized price list of recommended

6. MATERIALS AND EQUIPMENT

   All materials and equipment shall conform to the relevant Indian Standards and shall be of the approved make and design. Makes shall be strictly in conformity with list of approved manufacturers as per Indian Standards and code

7. ELECTRICAL INSTALLATION

   The electrical work related to Sanitary and Water Supply services, shall be carried out in full knowledge of, and with the complete coordination of the contractor. The electrical installation shall be in total conformity with the control wiring drawings prepared by the contractor and approved by the Architect/Consultant. All equipment shall be connected and tested in the presence of an authorized representative of the contractor.

   The Sanitary and Water Supply system shall be commissioned only after the contractor has certified in writing that the electrical installation work for Sanitary and Water Supply services has been thoroughly checked tested and found to be totally satisfactory and in full conformity with the contract Drawings, Specifications and manufacturers instructions. It is to be clearly understood that the final responsibility for the sufficiency, adequacy and conformity to the contract requirements, of the electrical installation work for Sanitary and Water Supply services, lies solely with the contractor.

8. BALANCING, TESTING AND COMMISSIONING

   Balancing of all water systems and all tests as called for the Specifications shall be carried out by the contractor though a specialist group, in accordance with the Specifications and ASPE / ASHRE Guide lines and Standards. Performance test shall consist of three days of 10 hour each operation of system for each season.

   The installation shall be tested again after removal of defects and shall be commissioned only after approval by the BRBNMPL's site representative. All tests shall be carried out in the presence of the representatives of the Architect/Consultant and BRBNMPL's site representative.

9. OPERATING INSTRUCTION & MAINTENANCE MANUAL

   Upon completion and commissioning of part Sanitary and Water Supply system the contractor shall submit a draft copy of comprehensive operating instructions, maintenance schedule and log sheets for all systems and equipment included in this contract. This shall be supplementary to manufacturer's operating and maintenance manuals. Upon approval of the draft, the contractor shall submit four (4) complete bound sets of typewritten operating instructions and maintenance manuals; one each for retention by Consultant and BRBNMPL's site representative and two for BRBNMPLs Operating Personnel. These manuals shall also include basis of design, detailed technical data for each piece of equipment as installed, spare parts manual and recommended spares for 4 year period of maintenance of each equipment.

10. ON SITE TRAINING

Upon completion of all work and all tests, the Contractor shall furnish necessary operators, labor and helpers for operating the entire installation for a period of fifteen (15) working days of ten (10) hours each, to enable the BRBNMPL's staff to get aquatinted with the operation of the system. During this period, the contractor shall train the BRBNMPL's personnel in the operation, adjustment and maintenance of all equipment installed.

11. MAINTENANCE DURING DEFECTS LIABILITY PERIOD

1. Complaints

The Tenderer shall receive calls for any and all problems experienced in the operation of the system under this contract, attend to these within 10 hours of receiving the complaints and shall take steps to immediately correct any deficiencies that may exist.

2. Repairs

All equipment that requires repairing shall be immediately serviced and repaired. Since the period of Mechanical Maintenance runs for one year concurrently with the defects liability period, all replacement parts and labour shall be supplied promptly free-of-charge to the BRBNMPL.

SANITARY FIXTURES & FITTINGS

2.1 Water Closet

Water closet shall be wash down or syphonic wash down type floor or wall mounted set, as shown in the drawings, designed for low volume flushing from 3-4.5 litres of water, flushed by means of a dual flush Valve for commercial & dual flush tank/flush valve for residential (as detailed in the drawings or as directed by the BRBNMPL's Site Representative). Flush pipe / bend shall be connected to the WC by means of a suitable rubber adaptor. Wall hung WC shall be supported by CI floor mounted chair which shall be fixed in a manner as approved by the BRBNMPLs Site Representative.

Each WC set shall be provided with approved quality of seat, rubber buffers and chromium plated hinges. Seat shall be so fixed that it remains absolutely stationary in vertical position without falling down on the WC.

Each WC shall be provided with 110 mm dia (OD) PVC Pan Connector connecting the ceramic outlet of WC to CI pipe.

2.2 Urinals

Urinals shall be lipped type half stall with glazed vitreous China of size as called for in the Bill of Quantities.

Half stall urinals shall be provided with 15mm dia CP spreader, 32mm dia CP domical waste and CP cast brass bottle trap with pipe and wall flange and shall be fixed to wall by CI brackets, CI wall clips and CP brass screws as recommended by manufacturer complete as directed by the BRBNMPL's Site Representative.

Flushing for urinals shall be by means of no hand operation, infrared electric flush valve with complete kit of plumbing, electrical and electronic items, infrared photo cells, solenoid valve transformer and electrical connection. The automatic flush sensor plate shall be flush and press fitted and be of high quality mirror polish finish. Each urinal shall be provided with one flush valve unit.

Flush pipes shall be pvc pipes concealed in wall chase but with chromium plated bends at inlet and outlet.

Urinal Partitions

Urinal partitions shall be white glazed vitreous china of size specified in the Schedule of Quantities.

Porcelain partitions shall be fixed at proper heights with CP brass bolts, anchor fasteners and MS clips as recommended by the manufacturer and directed by the BRBNMPL's Site Representative.

2.3 Wash Basin

Wash basins shall be white glazed vitreous china of size, shape and type specified in the Schedule of Quantities.

Each basin shall be provided with painted MS angle or CI brackets and clips and the basin securely fixed to wall/counter slab. Placing of basins over the brackets without secure fixing shall not be accepted. The MS angle shall be provided with two coats of red oxide primer and two coats of synthetic enamel paint of make, brand and colour as approved by the BRBNMPL's Site Representative. The cost of fixing the basin shall be inclusive of supply and installation of brackets as described above.

Each basin shall be provided with 32mm dia CP waste with overflow, pop-up waste or rubber plug and CP brass chain as specified in the Schedule of Quantities.

Each basin shall be provided with or without hot and cold water mixing fitting or as specified in the Schedule of Quantities.

2.4 Sinks

Sinks shall be stainless steel or any other material as specified in the Schedule of Quantities.

Each sink shall be provided with painted MS or CI brackets and clips and securely fixed. Counter top sinks shall be fixed with suitable painted angle iron brackets or clips as recommended by the manufacturer. Each sink shall be provided with 40mm dia CP waste and rubber plug with CP brass chain as given in the Schedule of Quantities. The MS angle shall be provided with two coats of red oxide primer and two coats of synthetic enamel paint of make, brand and colour as approved by the BRBNMPL's site representative.

Sanitary fittings for sinks shall be deck mounted or wall mounted CP swivel faucets with or without hot and cold water mixing fittings as specified in the Schedule of Quantities. Installation of fittings shall be measured and paid for separately.

2.5 Flow Control Device

Approved / rated flow control fitment in brass body, chrome outer cover, rated for flow / discharge of the fixture.

2.6 Janitor's Sink

Janitor's sink shall be stainless steel, single bowl type of size as called for in the Schedule of Quantities, provided with painted R.S. or CI brackets and clips and securely fixed. Each sink shall be provided with 40mm dia CP waste. Fixing shall be as directed by the BRBNMPL's Site Representative.

The supply fittings for Janitor's sink shall be wall mounted type of size as mentioned in Schedule of Quantities.

2.7 Liquid Soap Dispenser

Liquid Soap Dispenser shall be wall/counter mounted suitable for dispensing liquid soaps, lotions, detergents. The cover shall lock to body with concealed locking arrangement, opened only be key provided.

Liquid soap dispenser body and shank shall be of high impact resistance material. The piston and spout shall be stainless steel with 1 litre capacity polyethylene container.

The valve shall operate with less than 2.27 Kg (5 lbs) of force.

2.8 Hand Drier

The hand drier shall be no touch operating type with solid state time delay to allow user to keep hand in any position.

The hand drier shall be fully hygienic, rated for continuous repeat use (CRU).

The rating of hand drier shall be such that time required to dry a pair of hands up to wrists is approximately 30 seconds.

The hand drier shall be of wall mounting type suitable for 230 V, single phase, 50 Hz, AC power supply.

2.9 Toilet Paper Holder

Toilet paper holder shall be white glazed vitreous china or chrome plated of size, shape and type specified in the Schedule of Quantities.

Porcelain toilet paper holder shall be fixed in walls and set in cement mortar 1:2 (1 cement : 2 coarse sand) and fixed in relation to the tiling work.

The latter (chrome) shall be fixed by means of screws/capping having finish similar to the toilet paper holder in wall/temper partitions with raw l plugs or nylon sleeves. When fixed on timber partition, it shall be fixed on a solid wooden base member provided by the BRBNMPL's Site Representative.

2.10 Towel Rail

Towel rail shall be chromium plated brass or of stainless steel or powder coated brass of size, shape and type specified in the Schedule of Quantities.

Towel rail shall be fixed with screws/capping having finish similar to the towel rail in wall with rawl plugs or nylon sleeves and shall include cutting and making good as required or directed by the BRBNMPL's Site Representative.

2.11 Toilets for disabled

Where specified, in washroom facilities designed to accommodate physically disabled, accessories shall be provided as directed by the BRBNMPL's Site Representative. Stainless steel garb bars of required size suitable for concealed or exposed mounting and opened non-slip gripping surface shall be provided in all washroom. The flushing cistern/valve shall be provided with chromium plated long handles.

Each basin shall be provided with 32mm dia CP waste with overflow, pop-up waste or rubber plug and CP brass chain as specified in the Bill of quantities.

Each basin shall be provided with hot and cold water mixing fitting or as specified in the Bill of quantities.

3.0 MOCKUP AND TRIAL ASSEMBLY

The installation of the sanitary fixtures and fittings shall be as per the shop drawings approved by the Architect/Consultant.

The contractor shall have to assemble at least one set of each type of sanitary fixtures and fittings in order to determine precisely the required supply and disposal connections. Relevant instruction from manufacturers shall be followed as applicable. This trial assembly shall be developed to determine the location of puncture holes, holding devices etc which will be required for final installation of all sanitary fixtures and fittings. The above assembly shall be subject to final approval by the Architect / Interior Designer.

The fixtures in the trial assembly can be re-used for final installation without any additional payments for fixing or dismantling of the fixtures.

4.0 SUPPORTING AND FIXING DEVICES

The contractor shall provide all the necessary supporting and fixing devices to install the sanitary fixtures and fittings securely in position. The fixing devices shall be rigidly anchored into the building structure. The devices shall be rust resistant and shall be so fixed that they do not present an unsightly appearance in the final assembly. Where the location demands, the Architect may instruct the contractor to provide chromium plated or other similarly finished fixing devices. In such circumstances the contractor shall arrange to supply the fixing devices and shall be installed complete with appropriate vibration isolating pads washers and gaskets.

5.0 FINAL INSTALLATION

The contractor shall install all sanitary fixtures and fittings in their final position in accordance with approved trial assemblies and as shown on drawings. The installation shall be complete with all supply and waste connections. The connection between building and piping system and the sanitary fixtures shall be through proper unions and flanges to facilitate removal/replacement of sanitary fixtures without disturbing the built in piping system. all unions and flanges shall match in appearance with other exposed fittings.

Fixtures shall be mounted rigid, plumb and to alignment. The outlets of water closet pans and similar appliances shall be examined to ensure that outlet ends are butting on the receiving pipes before making the joints. It shall be ensured that the receiving pipes are clear of obstruction. When fixtures are being mounted, attention shall be paid to the possibility of movement and settlement by other causes. Overflows shall be made to ensure that necessary anchoring devices have been provided for supporting water closets, wash basins, sinks and other appliances.

6.0 PROTECTION AGAINST DAMAGE

The contractor shall take every precaution to protect all sanitary fixtures against damage, misuse cracking, staining, breakage and pilferage by providing proper wrapping and locking arrangement till the completion of the installation. At the time of handing over, the contractor shall clean disinfect and polish all the fixtures and fittings. Any fixtures and

fittings found damaged, cracked chipped stained or scratched shall be removed and new fixtures and fittings free defects shall be installed at his own cost to complete the work.

7.0 MEASUREMENT

7.1 Rate for fixing only of sanitary fixtures accessories, CP fittings shall etc include all items, and operations stated in the respective specifications and bill of quantities and nothing extra is payable.

7.2 Rates for all items under specifications para above shall be inclusive of cutting holes and chases and making good the same. CP screws nuts, bolts and any fixing arrangements required and recommended by manufacturers, testing and commissioning and making good to the satisfaction of the BRBNMPL's Site Representative.

8.0 TESTING

All appliances, fixtures and fittings shall be tested before and after installation. Water seals of all appliances shall be tested. The contractor shall block the ends of waste and ventilation pipes and shall conduct an air test.

WATER SUPPLY SYSTEM

CPVC Pipes & Fittings

The pipes shall be CPVC (Chlorinated Poly Vinyl Chloride) material for hot & cold water supply piping system wth pipes as per CTs SDR -11at a working pressure of 320 PSI at 23 deg C and 80 PSI at 82 deg.C, using solvent welded CPVC fittings i.e. Tees, Elbows, Couplees, Unions, Reducers, Brushing etc. including transition fittings (connection between CPVC & Metal pipes / GI) i.e. Brass adapters (both Male & Female threaded and all conforming to ASTM D-2846 with only CPVC solvent cement conforming to ASTM F-493, with clamps / structural metal supports as required /directed at site including cutting chases & fitting the same with cement concrete / cement mortar as required, including painting of the exposed pipes with one coat of desired shade of enamel paint. All termination points for installation of faucets shall have brass termination fittings. Installation shall be to the satisfaction of manufacturer & Project Manager.

i. Joining Pipes & Fittings

a. Cutting:
Pipes shall be cut either with a wheel type plastic pipe cutting or hacksaw blade and care shall be taken to make a square cut which provides optimal bonding area within a joint.

b. Deburring / Beveling:
Burrs and fittings should be removed from the outside and inside of pipe with a pocket knife or file otherwise burrs and fittings may prevent proper contact between pipe and fittings during assembly.

c. Fitting preparation:
A clean dry rag/cloth should be used to wipe dirt and moisture from the fitting sockets and tubing end. The tubing should make contact with the socket wall 1/3 or 2/3 of the way into the fitting socket.

d. Solvent Cement Application:
Only CPVC solvent cement confirming to ASTM-F493 should be used for joining pipe with fittings. An even coat of solvent cement should be applied on the pipe end and a thin coat inside the fitting socket, otherwise too much of cement solvent can cause clogged water ways.

e. Assembly:
After applying the solvent cement on both pipe and fitting socket, pipe should be inserted into the fitting socket within 30 seconds, and rotating the pipe ¼ to ½ turn while inserting so as to ensure even distribution of solvent cement with the joint. The assemnbled system should be held for 10 seconds (approximately) in order to allow the joint to set up.

An even bead of cement should be evident around the joint and if this bead is not continuos remake the joint to avoid potential leaks.

Set & Cure times:

Solvent cement set and cure times shall be strictly adhered to as per the below mentioned table.

Minimum Core prior to pressure testing at 150 PSI

Ambient Temperature during Core period	Pipe Size	
	½ " 1"	1.¼" 2"
Above 15 deg. C	1 Hr	2 Hrs
4-15 deg.C	2 Hrs	4 Hrs
Below 4 deg C	4 Hrs	8 Hrs

Special care shall be exercised when assembling flow guard systems in extremely low temperature (below 4°C) or extremely high temperature (above 45°C) In extremely hot temperatures, make sure that both surfaces to be joined are till wet with cement solvent when putting them together.

f. Testing
Once an installation is completed and cored as per above mentioned recommendations, the system should be hydrostatically pressure tested at 150 psi(10 Bar) for one hour. During pressure testing, the system should be fitted with water and if a leak is found, the joint should be cut out and replacing the same with new one by using couplers.

ii. Transition of CPVC to Metals

When making a transition connection to metal threads, special Brass / plastic transition fitting (Male and female adapters) should be used. Plastic threaded connections should not be over torqued Hard tight pluts one half turn should be adequate.

iii. Threaded Sealents

Teflon tape shall be used to make threaded connections leak proof.

iv. Solvent Cement

Only CPVC solvent cement conforming to ASTMF 493 should be used for joining pipe with fittings and valves. Flowguard CPVC cement solventhave a minimum shelf life of 1 year. Aged cement solvent will often change colour or being to thicken and become gelatinous or jelly like and when this happens, the cement should not be used. The cement solvent should be used within 30 days after opening the company's seal and tightly close the seal after using inorder to avoid its freezing. The freezed cement solvent should be discarded immediately and fresh one should be used. The CPVC solvent cement usage should be adhered to as given in table below

Diameter of pipe in inch (flowguard)	½"	¾"	1"	¼"	1½"	2"
Approx. nos. of joints which can be mode per litre of solvent cement.	200 Nos	180 Nos	150 Nos	130 Nos	100 Nos	70 Nos

v. Hangers and supports

For Horizontal runs, support should be given at 3 feet (90 cm) intervals for diameters of one inch and below and at 4 feet (1.2m) intervals for larger sizes.

Hangers should not have rough or sharp edges which come in contact with the tubing. All these hangers & supports shall be hot dipped galvanised.
Supports should be as per the below mentioned table:

Size of Pipe	21°C	49°C	71°C	82°C
Inch	Ft.	Ft.	Ft.	Ft.
½"	5.5	4.5	3.0	2.5
¾"	5.5	5.0	3.0	2.5
1"	6.0	5.5	3.5	3.0
1¼"	6.5	6.0	3.5	3.5
1½"	7.0	6.0	3.5	3.5
2"	7.0	6.5	4.0	3.5

2. PIPING INSTALLATION SUPPORT

Tender drawings indicate schematically the size and location of pipes. The Contractor, on the award of the work, shall prepare detailed working drawings, showing the cross-sections, longitudinal sections, details of fittings, locations of isolating and control valves, drain and air

valves, and all pipe supports. He must keep in view the specific openings in buildings and other structure through which pipes are designed to pass.

Piping shall be properly supported on, or suspended from, on stands, clamps, hangers as specified and as required. The Contractor shall adequately design all the brackets, saddles, anchor, clamps and hangers, and be responsible for their structural stability.

Pipe work and fittings shall be supported by hangers or brackets so as to permit free expansion and contraction. All accessories and ancillaries of support system such as brackets, saddles, clamps, hangers etc. shall be hot dip galvanized after fabrication. Further to permit free movement of common piping, support shall be from a common hanger bar, fabricated from galvanised steel sections.
Pipe hangers shall be provided at the following maximum spacings:

Pipe Dia (mm)	Hanger Rod Dia (mm)	Spacing between Supports (m
Up to 25	6	2
32 to 50	10	2.7
80 to 100	12	2.7
125 to 150	16	3.6
200 to 300	19	5.3

Insulated piping shall be supported in such a manner as not to put undue pressure on the insulation. 14 gauge metal sheet shall be provided between the insulation and the clamp, saddle or roller, extending at least 15 cm. on both sides of the clamps, saddles or roller.

All pipe work shall be carried out in a proper workman like manner, causing minimum disturbance to the existing services, buildings, roads and structure. The entire piping work shall be organized in consultation with other agencies work, so that area can be carried out in one stretch.

Cut-outs in the floor slab for installing the various pipes area are indicated in the drawings. Contractor shall carefully examine the cut-outs provided and clearly point out wherever the cut-outs shown in the drawings, do not meet with the requirements.

Pipe sleeves, larger diameter than pipes, shall be provided wherever pipes pass through walls and slab and annular space filled with fiberglass and finished with retainer rings.

The contractor shall make sure that the clamps, brackets, saddles and hangers provided for pipe supports are adequate or as specified / approved by Consultants. Piping layout shall take due care for expansion and contraction in pipes and include expansion joints where required.

All pipes shall be accurately cut to the required sizes in accordance with relevant BIS codes and burrs removed before laying. Open ends of the piping shall be closed as the pipe is installed to avoid entrance of foreign matter. Where reducers are to be made in horizontal runs, eccentric reduces shall be used for the piping to drain freely. In other locations, concentric reduces may be used.

All buried pipes for CWS shall be cleaned and coated with two coats of bitumen and then wrapped with two layers of 400 microne polythene sheet coating.

Automatic air valves shall be provided at all high points in the piping system for venting. All valves shall be of 15mm pipe size and shall be associated with an equal size isolation ball valve. Automatic air valves shall also be provided on hot water risers.

Discharge from the air valves shall be piped through a galvanized steel pipe to the nearest drain or sump. All pipes shall be pitched towards drain points.

Pressure gauges shall be provided as shown on the approved drawings and include in Bill of Quantities. Care shall be taken to protect pressure gauges during pressure testing.

Temperature gauge as specified shall be provided at the hot water supply and return and as shown on drawings and included in Bill of Quantities.

3. FERRULES

The ferrules for connection with main shall generally conform to IS: 2692. It shall be of non-ferrous materials with a bell mouth cover and shall be of nominal bore as specified. The ferrule shall be fitted with a screw and plug or valve capable of completely shutting of the water supply to the communication pipe, as and when required.

3.1 Fixing Ferrules

For fixing ferrule in cast iron mains, the empty main shall be drilled and tapped at 45 deg to the vertical and the ferrule screwed in. The ferrule must be so fitted that no portion of the shank shall be left projecting within the main into which it is fitted.

4. WATER METERS

Water meters of approved make and design shall be supplied for installation at locations as shown. The water meters shall meet with the approval of local supply authorities. Suitable valves and chambers or wall meter box to house the meters shall also the be provided along with the meters.

The meters shall conform to Indian Standard IS : 779 and IS : 2373

Provision shall also be made to lock the water meter. The provision shall be such that the lock is conveniently operated from the top. Where the provision is designed for use in conjunction with padlocks the hold provided for padlocks shall be a diameter not less than 4mm.

4.1 Installation of water meter and stop cock

The G.I lines shall be cut to the required lengths at the position where the meter and stop cock are required to be fixed. Suitable fittings shall be attached to the pipes. The meter and stop cock shall be fixed in a position by means of connecting pipes, jam nut and socket etc. The stop cock shall be fixed near the inlet of the water meter. The paper disc inserted in the ripples of the meter shall be removed. And the meter installed exactly horizontal or vertical in the flow line in the direction shown by the arrow cast on the body of the meter. Care shall be taken that the factory seal of the meter is not disturbed. Wherever the meter shall be fixed to a newly fitted pipe line, the pipe line shall have to be completely washed before fitting the meter.

5. TESTING

The contractor shall notify the Architect three days in advance of any test so that the Architect can witness the tests if he so wishes.

All water supply system shall be tested to hydrostatic pressure test of atleast one and a half (1.5) times the maximum pressure but not less than 10Kg/Sq.cm for a period of not less than 8 hours. All leaks and defects in joints revealed during the testing shall be rectified and got approved at site by retest. Piping required subsequent to the above pressure test shall be retested in the same manner.

System may be tested in sections and such sections shall be entirely rested on completion.

The contractor shall make sure that proper noiseless circulation of fluid is achieved through the entire piping network of the system concerned. In case of improper circulation, the contractor shall rectify the defective connections. He shall bear all expenses for carrying out the above rectification's including the tearing up and refinishing of floors and walls as required.

In addition to the sectional testing carried out during the construction, contractor shall test the entire installation after connections to the overhead tanks or pumping system or mains. He shall rectify all leakages and shall replace all defective materials in the system. Any damage done due to carelessness, open or burst pipes or failure of fittings, to the building furniture and fixtures shall be made good by the contractor during the defects liability period without any cost.

After commissioning of the water supply system, contractor shall test each valve by closing and opening it a number of times to observe if it is working efficiently. Valves which do not effectively operate shall be replaced by new ones at no extra cost and the same shall be tested as above.

A test register shall be maintained and all entries shall be signed and dated by contractor(s) and BRBNMPL's site representative.

6. CUTTING & CHASES IN MASONRY WALLS

Cold water distribution pipes to fixtures and equipment exposed to view in the bathrooms, kitchens, and sanitary compartments shall be chased into walls or floors or placed in wall cavities. The contractor shall be responsible for cutting all notches. Chases and recesses in walls and floors and only a diamond cutter shall be used. The maximum size of conduit or pipe permitted to be concealed in floor slabs shall be 32 mm diameter unless otherwise approved by the Architect.

The chases upto 7.5 x 7.5 cm shall be made in the walls for housing GI pipes etc. These shall be provided in correct positions as shown in the drawings or directed by the Architects. Chases shall be made by chiseling out the masonry to proper line and depth. After the pipes etc are fixed in chases, the chases shall be filled with cement mortar 1:2:4 or as may be specified, and made flush with the masonry surface. The concrete surface shall be roughened with wire brush to provide a key for plastering.

Where pipes pass through beams or structural walls, subject to the approval of the Structural Consulting Engineer, the Contractor shall ensure that sizes and locations of openings required are formed in when the relevant beams or walls are cast.

7. VALVES

All valves (gate, globe, check, safety) shall be of gun metal or brass type suitable for the particular service as specified. All valves shall be of the particular duty and design as specified. Valves shall either be of screwed type or flanged type as specified with suitable flanges and non-corrosive bolts and gaskets. Tail pieces as required shall be supplied along with valves. Gate, globe and check valves shall conform to Indian Standard IS:776 and non-return valves and swing check type reflux to IS : 5312.

Sluice valves, where specified shall be flanged sluice valves of cast iron body. The spindle, valve seat and wedge nuts shall be gunmetal. They shall generally have non-rising spindle and shall be of the particular duty and design as specified. The valves shall be supplied with suitable flanges, non-corrosive bolts and asbestos fiber gaskets. Sluice valves shall conform to Indian standard IS : 780 and IS : 2906.

Ball valves with floats to be fixed in storage tanks shall consist of cast brass lever arm having copper balls (26 SWG) screwed to the arm integrally. The copper ball shall have bronze welded seams. The closing / opening mechanism incorporating the piston and cylinder shall be non-corrosive metal and include washers. The size and construction of ball valves and float shall be suitable for desired working pressure operating the supply system. Where called for brass valves shall be supplied with brass hexagonal back nuts to secure them to the tanks and a socket to connect to supply pipe.

Sl.No	Type of Valve	Size	Construction	Ends
a.	Isolating Valve	15mm to 50mm 65mm & above	Gun Metal Gun Metal	Screwed Flanged
b.	Sluice Valve & Butterfly Valve	65mm & above	Cast Iron	Flanged
c.	G.M. non return valve	15mm to 50mm 65mm & above	Gun Metal Gun Metal	Screwed Flanged
d.	Flap Type – non return valve	65mm & above	Cast Iron	Flanged

All valves shall be suitable for the working pressure involved.

7.1 Pressure Relief Valves

Each pressure relief valve shall be of the fully enclosed type and fitted with hand easing gear.

Each pressure relief valve in a pressure reducing station shall have a flow capacity equal to that of the pressure reducing valve.

Each pressure relief valve shall be provided with in built filters as well as with cleaning mechanism.

Pressure relief valves in locations other than reducing stations shall have flow capacities equal to that of the associated equipment.

7.2 Pressure Gauge

The pressure gauge shall be constructed of die cast aluminum and stove enameled. It shall be weather proof with an IP 55 enclosure. It shall be a stainless steel Bourden tube type pressure gauge with a scale range from 0 to 16kg / cm square and shall be constructed as per IS:3524. Each pressure gauge shall have a siphon tube connection. The shut off arrangement shall be by ball valve.

8. CONNECTIONS TO WATER TANKS

The contractor shall provide all inlets, outlet, washouts, vents, ball cocks, overflows control valves and all such other piping connections including level indicator to water storage tanks as called for. All pipes crossing through RCC work shall have puddle flanges fabricated from MS/GI pipes of required size and length and welded to 6/8 mm thick MS plate. All puddle flanges must be fixed in true alignment and level to ensure further connection in proper order.

Full way gate valves of a approved make shall be provided as near the tank as practicable on every outlet pipe from the storage tank except the overflow pipe. Overflow and vent pipes shall terminate with mosquito proof grating.

The overflow pipe shall be so placed to allow the discharge of water being readily seen. The overflow pipe shall be size as indicated. A stop valve shall also be provided in the inlet water connection to the tank. The outlet pipes shall be fixed approximately 75mm above the bottom of the tank towards which the floor of the tank is sloping to enable the tank to be emptied for cleaning.

9. PIPE PROTECTION (FOR COLD WATER PIPES BURIED IN TRENCHES / GROUND / EARTH)

All buried pipes shall be cleaned with zinc chromate primer and bitumen paint, wrapped with three layers of fibre glass tissue, each layer laid in bitumen and placed on concrete blocks with PUF saddles dipped in bitumen at every 2 meters. The pipes where laid under floor shall be encased with 100mm thick jamuna sand all around in addition to protective coating as described above.

10. THRUST BLOCKS

In case of bigger pipes (80mm dia and above), thrust blocks of cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregated of 20mm nominal size) shall be constructed on all bends as directed by the BRBNMPL's site representative.

11. MASONRY CHAMBER

i. All masonry chambers for stop cocks, sluice valves and meter etc. shall be built as per supplied drawings.

ii. The excavation for chambers shall be done true to dimension and level indicated on plans or as directed by the BRBNMPL's site representative.

iii. Concrete shall be of cement concrete 1:3:6 (1 cement: 3 coarse sand: 6 graded stone aggregate 40mm nominal size.

iv. Brick shall be of lass designation 75 in cement mortar 1:5 (1 cement: 5 fine sand)

v. Inside Plastering not less than 12mm thick shall be done in cement mortar 1:3 (1cement: 3 fine sand) finished with a floating coat of neat cement.

12. SHIFTING OF EXCAVATED SURPLUS MATERIAL

Contractor shall make his own arrangement to shift the surplus excavated material the site limits as directed by BRBNMPL's site representative at free of cost within time limit.

INTERNAL DRAINAGE (SOIL, WASTE, VENT & RAIN WATER PIPES)

1.0 POLYVINYL CHLORIDE (PVC) PIPES AND FITTINGS

PVC (SWR) class pipes and fittings of dia 75mm OD, 90mm OD, 110mm OD and 160mm OD of Type A for use in rain water and ventilation and of Type B for soil and waste discharging system and conforming to IS 13592: 1992, shall be used. The pipes shall be supplied in nominal lengths of 2, 3, and 4 or 6 meters, tolerance on specified lengths shall be +/-10mm. Any physical test requirements shall be as per IS13592-1992.
Rain water pipes higher than 160mm OD in diameter shall be conform to IS 4985-1988. The pipes used for rainwater disposal system shall not be less than 4kg/cm2 and fittings shall be of injection moulded PVC conforming to IS 7634 (Part1) - 1975.

1.1 HANDLING

Because of their lightweight, there may be a tendency for the PVC pipes to be thrown much more. Reasonable care should be taken in handling and storage to prevent damage to the pipes. Contractor should hold the fullest responsibility in this case. On no account the pipes should be dragged on the ground. Pipes should be given adequate supports at all times.

1.2 LAYING

The PVC pipes shall be laid under the floors below slab or on walls either buried or exposed as the case may be, as per the specifications and instructions of the Engineer. The minimum thickness of fittings shall be of 3.2 mm. The fittings shall be of injection-moulded type with solvent cement joint or rubber ring joint. The pipes and fittings shall be capable of withstanding sun's rays. PVC pipes laid below slab or suspended in ceiling shall be supported by angle brackets / MS supports as detailed in the drawings and as per the instruction of the Engineer. The cost of drilling holes in RCC slab, floor, RCC/masonry retaining wall with the core cutting machine and making good the same with approved quality cement concrete etc.,

1.3 JOINTING

The jointing of pipes to fittings shall be done as per the manufacturer's instructions / recommendations and as per the Engineer instruction.
The PVC pipes and fittings shall be joined with Solvent Cement and jointing shall be carried out as follows:

1. Cut the spigot end of the pipe square.
2. All burrs from the internal and external surfaces should be removed.
3. The spigot should be marked with a pencil line and a distance equivalent to the socket depth. Clean the surface within the marked area.
4. Apply uniform coat of solvent cement on the external surface to the pipe and a lighter coat on the internal surface of the fitting.

5. Insert the pipe end into the socket of the fitting and push it in upto the mark.

Remove the excess solvent cement and hold the joint firmly in position for 30 seconds to dry. Gluing should be avoided in a rainy or foggy weather.

The other method of jointing shall be by rubber rings. The material of rubber ring should conform to IS 5382-1969.The ring is housed in groove formed in a plastic or metallic housing. The rubber is compressed and makes a seal between the pipe and housing. Lubricating paste should be applied before compressing the rubber. Where natural rubber rings are used, mineral oil or petrol or grease should be used.

1.4 TESTING

PVC pipes and fittings shall be tested in accordance with IS 13592 - 1992. The openings of the pipes shall be sealed for the section to be tested. The water pressure of 0.5Mpa (50m of H_2o or 5.0 kg/cm^2) shall be maintained for a minimum period of 15 minutes and there should be no leakage at any joint.

2.0 RIGID PVC PRESSURE PIPES AND FITTINGS

The PVC pressure pipes and fittings shall be used for conveying wastewater from washbasins, kitchen sinks, floor drain connecting to washing machines and condensate drain etc.

The pipes shall be class III, 6 Kg/cm^2. PVC pipes and fittings shall be jointed with solvent cement. The pipes shall conform to IS 4985. Fittings shall be of injection moulded PVC conforming to IS 7634 (Part1) - 1975.

2.1 LAYING AND FIXING

The pipe laying and jointing shall be done in accordance with IS 7634 (Part 3) – 1975. Pipes shall be cut to size and chamfered well. Burrs if any shall be removed. Pipes and fittings shall be jointed using solvent cement or rubber ring joints. The pipes and fittings shall be jointed accurately without any stress to achieve leak proof joints.

2.2 TESTING

The method, which is commonly in use, is filling the pipe with water, taking care to evacuate any entrapped air and slowly raising the system to the test pressure. The test shall be done in accordance with IS 2065 – 1983 – code of practice for water supply in buildings. The test pressure shall be 5 kg/cm^2 or the maximum working pressure plus 50%, whichever is greater. The pressure shall be maintained for at least 4 hours.

3.0 PVC FLOOR TRAPS

The PVC floor trap shall be of multi-inlet and one single outlet type. The floor trap shall be deep seal type with an effective seal of minimum 50mm. The waste from sanitary fixtures shall be directly discharged to the floor trap. Jointing of the waste pipe to the floor trap shall be done as per manufacturer's instructions. The height riser fitting shall be made use of, wherever the floor drain is located in deep-sunk floors or is suspended from the ceiling. The floor trap shall be of reputed make and preferably of the same make as of the pipes used.

The floor trap shall be provided with 150 x 150mm square cast chrome plated or stainless steel grating with rim of approved design. Minimum thickness of the grating shall be 4 to 5mm.

The cost of removing and refixing of tiles and making good as per the instructions of the Engineer for fixing the grating floor trap shall not be paid separately.

The AHU floor drains shall be fitted with chrome plated funnel shaped grating.

4.0 VENT COWL

The supply and installation of PVC vent cowl shall conform to local codes and or British standards whichever is applicable code of practice. The cost of supply and installation of vent cowl shall be measured as part of soil and waste pipe.

5.0 ROOF DRAIN

The supply and installation of PVC roof drain and grating with water proofing flashing around the drain shall conform to the requirements of local codes and or British standard specifications whichever is applicable.

6.0 RELIEF VENT

The pressures in the drainage and vent stacks of a multi-storey building are constantly fluctuating. The vent stack connection at the base of the drainage stack and the branch vent connections to the branch drains cannot always eliminated these fluctuations. It then becomes extremely important to balance pressure throughout the drainage stack by means of relief vents located at various intervals. The fluctuations in pressure may be caused by simultaneous discharge of branches on various separated floors. Drainage stacks in buildings having more than 10 branch intervals should be provided with a relief vent at each tenth interval, counting from top most branch downward. The lower end of the relief vent should connect to the drainage stack below the drainage branch connection and the upper end should connect to the vent stack at least 900mm above the floor level.
Relief vents are required where a drainage stack offsets at an angle of more than 45 degrees to the vertical. Such offsets are subject to high pneumatic pressure increases and extreme surging flow conditions.

7.0 BASIC PIPING SYSTEM

Soil waste and vent pipes in shafts duct and in concealed areas i.e. false ceilings etc. shall consist of cast iron pipes & fittings as called for in general wastes and vents smaller than and upto 50mm dia shall be of GI.

The soil pipes shall be circular with a minimum diameter of 100mm. Pipes shall be fixed by means of stout GI clamps in two sections, bolted together, built into the walls wedged and neatly jointed as directed and approved by the BRBNMPL's site representative / Architect. 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.

Where indicated the soil pipes shall be continued upwards without any diminution in its diameter, without any bend or angle to the height shown in the drawings. Joints throughout shall be made with molten lead as described under jointing of cast iron pipes. Soil pipes shall be painted as provided under painting. The soil pipes shall be covered on top with cast iron terminal outlets as directed and approved. All vertical soil pipes shall be firmly fixed to the walls with properly fixed clamps and shall as far as possible be kept 50mm clear of wall. Waste pipes and fittings shall be of cast iron or galvanized mild steel pipes. Pipes shall be fixed jointed and painted as described in installation of soil, waste and vent pipes.

Every waste pipe shall discharge above the grating of properly trapped gully. The contractor will ensure that this requirement is adequately met with. Wherever floor traps are provided it shall be ensured that at least one wash is connected to such floor traps to avoid drying of water seal in the trap. Ventilating pipes shall be of cast iron or galvanized mild steel

pipes, conforming to the requirements laid down earlier. Anti-siphon vent pipes/relief vent pipes where called for on the drawings shall be of cast iron or galvanized mild steel pipes as specified. The pipes shall be of the diameter shown on the drawings.

All traps on branch soil and waste pipes shall also be ventilated at a point not less than 75mm or more than 300mm from their highest part and on the side nearest to the soil pipe or waste pipes.

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 BRBNMPL in the form of shop drawings so that other agencies are instructed to provide the same.

All the fittings used for connections between soil, waste and ventilation pipes and branch pipes shall be made by using pipe fittings with inspection doors for cleaning. The doors shall be provided with 3mm thick rubber insertion packing and when closed and bolted shall be air and water right.

Where soil, waste and ventilating pipes are accommodated in shafts ducts, adequate access to cleaning eyes shall be provided.

Head (starting point) of drains and sewage / waste water sumps (as and where applicable) having a length of greater than 4 m upto it connection to the main drain or manhole shall be provided with 80 / 100 mm vent pipe.

8.0 PIPING MATERIALS

EXTERNAL DRAINAGE(SEWAGE & STORM WATER DISPOSAL)

9.0 SOIL, WASTE & VENT PIPES

Soil waste and vent pipes in shafts under the floors / suspended below slab shall consist of cast iron pipes as described earlier. Waste pipes from bottle trap to floor / urinal traps for wash basin urinal and sink shall be GI pipes and fittings.

All Horizontal pies running below the slab and along the ceiling shall be fixed on structural adjustable clamps sturdy hangers of the design as called for in the drawings. The pipes shall be laid in uniform slope and proper levels. All vertical pipes shall be truly vertical fixed by means of stout clamps in tow sections bolted together built into the walls wedged and neatly jointed. The branch pipes shall be connected to the stack at the same angle as that of fittings. All connections between soil waste and ventilating pipes and branch pipes shall be made by using pipe fittings with inspection doors for cleaning. Pipes shall be fixed in a manner as to provide easy accessibility for repair and maintenance and shall not cause obstruction in shafts. Where the horizontal run off the pipe is long or where the pipes cross over building expansion joints etc. suitable allowance shall be provided for any movements in the pipes by means of expansion joint etc. such that any such movement does not damage the installation in any way.

All cast iron pipes and fittings shall be jointed with best quality soft pig lead free from all impurities conforming to IS 27.

Before jointing the interior of the socket and exterior of the spigots shall be thoroughly cleaned and dried. The spigot end shall be inserted into the socket right up to the back of the socket and carefully centered by two or three laps of threaded spun yarn, twisted into ropes of uniform thickness, well caulked into the back of the socket. No piece of yarn shall be shorter than the circumference of the pipe. The jointed pipe line shall be at required levels and alignment. The reminder of the socket is left for the lead caulking. Where the gasket has been tightly held a jointing ring shall be placed round the barrel against the face of the socket. Molten pig lead shall be poured to fill her remainder of the socket in one pouring. The lead then shall be solidly caulked with suitable tools by hammering right round the joints to make up for the shrinkage of the molten metal on cooling and preferably finish 3mm behind the socket face.

The depth of the lead joints for the cast iron pipes shall be 45mm for the pipes upto 100mm dia and 50mm for the beyond 100mm dia respectively.

The joint shall not be covered till the pipe line has been tested under pressure. Rest of pipe line shall be covered so as to prevent the expansion and contraction due to variation in temperature.

9.1 Rainwater pipes

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

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.

Rainwater in open courtyards shall be collected in catch basins and connected to the storm water drains.

Any dry weather flow from waste appliances e.g. AHU's, pump rooms, waste water sumps shall connected to sewers after traps and not in the storm water drainage systems.

9.2 Balcony / Planter drainage

Wherever required, all balconies terraces planters and other frontal landscape areas will be drained by vertical down takes or other type of drainage system show on the drawings and directed by the project manager.

10.0 TRAPS

10.1 Floor Traps

Floor traps where specified shall be siphon type full before P or S type cast iron having a minimum 50mm deep seal. The trap and waste pipes when buried below ground shall be set and encased in cement concrete blocks firmly supported on firm ground or when installed on a sunken RCC structural slab. The blocks shall be in 1:2:4 mix (1 cement : 2 coarse and : 4 stone aggregate 20mm nominal size).

Contractor shall provide all necessary shuttering and centering for the blocks. Size of the block shall be 30 x 30 cms of the required depth.

10.2 Floor Trap Inlet / Hopper

Bath room traps and connection shall ensure free and silent flow of discharging water. Where specified contractor shall provide a special type of floor inlet fitting fabricated from GI pipe, with one two or three inlet sockets welded on side to connect the waste pipe. All joint between waste hopper and CI inlet socket shall be lead caulked. Inlet shall be connected to a CI "P" trap. Floor trap inlet and the traps shall be set in cement concrete blocks where buried in floors without extra charge. Floor trap for the shower cubicle shall suit and as per the approval of BRBNMPL's site representative. All fabricated hopper shall be hot dip galvanized.

10.3 Floor Trap Grating

Floor and urinal traps shall be provided with 100-150mm square or round stainless steel gratings, with frame and rim of approved design and shape or as specified in the Bill of quantities approved by the BRBNMPL's site representative.

10.4 Cleanout Plugs

Floor Clean Out Plug
Clean out plug for soil. Waste or rain water pipes laid under floors shall be provided near pipe junctions bends, tees, "Ys" and on straight runs at such intervals as required as per site conditions. Clean out plugs shall terminate flush with the floor level. They shall be threaded and provided with key holes for opening. Clean out plugs shall be cast brass suitable for the pipe dia. With screwed to a GI socket. The socket shall be lead caulked to the drain pipes.

Cleanout on Drainage Pipes
Cleanout plugs shall be provided on head of each drain and in between at locations indicated on plans or directed by BRBNMPL's site representative. Cleanout plugs shall be of size matching the full bore of the pipe but no exceeding 150mm dia CO plugs on drains of greater diameters shall be 150mm dia. Fixed with a suitable reducing adapter.

Floor cleanout plugs shall be cast brass.

Cleanouts provided at ceiling level pipe shall be fixed to a CI flanged tail piece. The cleanout doors shall be specially fabricated from light weight galvanized sheets and angles with hinged type doors with fly nuts gasket etc as per drawing.

11.0 PIPE PROTECTION

Cast iron soil and waste pipes under floor in sunken slabs and in wall chases (when cut specially for the pipe) shall be encased in cement concrete 1:2:4 mix (1 cement : 2 coase and : 4 stone aggregate of 12 mm size) 10cm bed and alround. When pipes are running well above the structural slabs, the encased pipes shall be supported with suitable cement concrete pillars of required height and size at intervals directed by the Project Manager.

EXTERNAL DRAINAGE
(SEWAGE & STORM WATER DISPOSAL)

1. TRENCHING FOR PIPES AND DRAINS

1.1 Alignment & Grade

The sewer and storm water drainage pipes shall be carefully laid to levels and gradients shown in the plans and sections but subject to modification as shall be ordered 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 60cms below the finished ground level or as called for on the drawings.

1.2 Setting out Trenches

The contractor shall set out all trenches, manholes chambers and such other works to true grades and alignments as called for. He shall provide the necessary instruments for setting out and verification for the same. All trenches shall be laid to true grade and in straight lines and as shown on the drawings. The trenches shall be laid to proper levels by the assistance of boning rods and sight rails which shall be fixed at intervals not exceeding 10meters or as directed by the Project Manager.

1.3 Trench Excavation

The trenches for the pipes shall be excavated with bottoms formed to level and gradients as shown on the drawings or as directed by the Project Manager. In soft and filled in ground the Project Manager may require the trenches to be excavated to a greater depth than 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.

All excavations shall be properly protected were 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 75cms.

1.4 Timbering of Sewer and Trenches

The contractor shall at all times support efficiently and effectively the sides of all the trenches and other excavations by suitable timbering piling and sheeting and they shall be close timbered in loose or sandy strata and below the surface of the sub soil water level.

All timbering, sheeting and piling with their walling and supports shall be of adequate dimensions and strength and fully braced and strutted so that no risk of collapse or subsidence of the walls of the trench shall take place.

The contractor shall be held responsible and shall be accountable for the sufficiency of all timbering, bracings, sheeting and piling used and also for all damage to persons and property resulting from improper quality strength placing, maintaining or removing of the same.

1.5 Shoring of Buildings

The Contractor shall shore up all buildings, wall other structures, the stability of which is liable to be endangered by the execution of the work and shall be fully responsible for all damages to persons or property resulting from any accident.

1.6 Obstruction Road

The contractor shall not occupy or obstruct by his operation more than one half of the width of any road or street and sufficient space shall then be left for public and private transit. He shall remove the materials excavated and bring them back again when the trench is required to be refilled. The contractor shall obtain the consent of the Project Manager in writing before closing any road to vehicular traffic and the foot walks must be clear at all times.

1.7 Protection of pipes etc

All pipes water mains cables etc met in the course of excavation shall be carefully protected and supported. Care shall be taken not to disturb the cables the removal of which shall be arranged by the contractor with the written consent from the Project Manager.

1.8 Trench Back Filling

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 haunching 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.

1.9 Contractor to restore settlement and Damages

The contractor shall at his own costs and expenses, make good promptly during the whole period for the works in hand if any settlement occurs in the surfaces of roads, beams, footpaths gardens, open spaces etc in the public or private areas caused by his trenches or by his other excavations and he shall be liable for any accident caused thereby. He shall also at his own expense and charges repair (and make good) any damage done to building and other property. If in the opinion of the project manager he fails to make good such works with all practicable dispatch the Project Manager shall be at his liberty to get the work done by other means and the expenses thereof shall be paid by the contractor or deducted from any money that may be or become due to him or recovered from him by any other manner according to the laws of land.

The contractor shall at his own costs and charges provide places for disposal of all surplus materials not required to be used on the works. As each trench is refilled, surplus soil shall be immediately removed the surface shall be properly restored and roadways and sides shall be left clear.

1.10 Removal of water from sewer, Trench etc.,

The contractor shall at all times during the progress of work keep the excavations free from water which shall be disposed by him in a manner as will neither cause injury to the public health nor to the public or private property nor to the work completed or in progress not to the surface of any road or streets, nor cause any interference with the use of the same by the public.

1.11 Removal of Filth

All night soil filth or any other offensive mater met with during the execution of the works, shall not be deposited on the surface of any street or where it is likely to be a nuisance or passed into any sewer or drain but shall be immediately, after it is taken out of any trench, sewer or cess pool, put into the carts and removed to a suitable place to be provided by the contractor.

1.12 Width of Trench

The project manager shall have power by giving an order in writing to the Contractor to increase the maximum width/depth for excavation and backfilling in trenches for various classes of sewer manholes and other works in certain length to be specifically laid down by him, where on account of bad ground on other unusual conditions, he considers that such increased width/depths are necessary in view of the site conditions.

S.W. Gully Trap

Gully trap shall be stoneware conforming to IS:651. These shall be sound and free from visible defects such as fire cracks, or hair cracks. The glaze of the traps shall be free from cracks. They shall give a sharp clear note when struck with light hammer. There shall be no broken blisters. Each gully trap shall have one CI grating of square size corresponding to the dimensions of inlet of gully trap. It will also have a water tight CI cover with frame inside dimensions 300 x 300 mm the cover weighing not less than 4.5 kg and the frame not less than 2.7kg. the grating cover and frame shall be of good casting and shall have truly square machined seating faces.

Fixing of S.Gully Trap

The excavation for gully traps shall be done true to dimensions and levels as indicated on plans or as directed by the Project Manager/Consultant/Architect. The gully traps shall be fixed on cement concrete foundation 65cm square and not less than 10cm thick. The mix for the concrete will be1:4:8. The joining of gully outlet to the branch drain shall be done similar to the jointing of S.W.Pipes described earlier. After fixing and testing gully and branch drain, a brick work of specified class in cement mortar1:5 shall be built with a half brick masonry work round the gully trap from the top of the bed concrete upto ground level. The space between the chamber and trap shall be filled in with cement concrete 1:3:6. The upper portion of the chamber i.e above the top level of the trap shall be plastered inside the

cement mortar 1:3 finish with a floating coat of neat cement. The corners and bottom chamber shall be rounded off so as to slope towards the grating.

CI cover with frame 300 x 300mm (inside) shall then be fixed on the top of the brick masonry with cement concrete 1:2:4 and rendered smooth. The finished top cover shall be so as to prevent the surface water from entering the gully trap.

Measurements

Gully traps shall be measured by the number and rate which shall include all excavation, foundation, concrete, brick masonry, cement plaster inside and outside, CI grating and sealed cover and frame.

2. CONSTRUCTION OF MANHOLE

Where 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. Manhole shall be sized and depths as called for in the drawings and Bill of Quantities.

The manhole shall be built on a base concrete 1:3:6 of 150mm thickness for manholes upto 1500mm depth and 250mm thickness for manholes from 1500 to 2500 depth and 300mm thickness manholes of depth greater than 2500mm. Reinforcement as shown shall be provided in the base slabs.

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 (at least 12mm thick) and finish with a coat of neat cement external plaster shall be rough plaster in 1:3, PCC benching and semi circular channels of the same diameter as the pipes shall be provided and finished with neat cement coating.

Above the horizontal diameter, the sides of channel shall be extended vertically to the same level as the crown of the outgoing pipe and the top edge shall be suitably rounded off. The branch channels shall also be similarly constructed with respect to the benching but a their junction with the main channel an appropriate fall suitably rounded off in the direction of flow in the main channel shall be given. All manholes/sumps shall be provided with poly propylene coated steel reinforced foot rest. The ploypropelene shall confirm to ASTM D-4101 specification, injection moulded around 12mm 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. Unless otherwise mentioned, manholes shall be constructed to the requirements of Indian Standard IS:4111 (Part 1). All manholes shall be constructed so as to be water tight under test. All angles shall be rounded to a 75mm radius with cement plaster 20mm thick. The benching at the side shall be carried out in such a manner so as to provide no lodgment for any splashing in case of accidental flooding. Manhole cover with frame shall be of cast iron of an approved make. The covers and frame shall generally be double seal as specified in the Bill of Quantities.

2.1 Measurements

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.

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 are inclusive in the cost of manhole viz;

i. Bed concrete
ii. Brick work
iii. Plastering (inside & outside)
iv. RCC top slab, benching and channeling including drop connections.
v. Supply and fix foot rests.
vi. Keeping holes and embedding pipes for all the connections.
vii. Excavation refilling necessary de-watering and disposing off surplus soil to a places as directed by Project Manager.
viii. Curing.
ix. Cost of angle frame and embedding the frame in concrete bed.
x. Testing.
xi. De-watering of chambers.

2.2 Drop Connection

Drop connection shall be provided between branch sewer and main sewer in the main ewer itself in steep ground when the difference in invert level of two exceeds 60cms of the required sizes. Drop connections from gully traps to main sewer in rectangular shall be made inside the manholes and shall have CI special types door bend on to top and heel rest bend at bottom connected by a CI pipe. The pipe shall be supported by holder bat clamps at 180 cms intervals with atleast one clamp for each drop connection. All joints shall be lead caulked joints 25mm deep.

Drop connections from branch sewer to main sewer shall be made outside the manhole wall with CI/CI class LA pipe. Connection, vertical pipe and bend at the bottoms. The top of the tee shall be finished upto the surface level and provided with a CI hinges type frame and cover 30cms x 30cms. The connection and tee upto the surface chamber of the tee.

Drop connection made from vertical stacks directly into manholes shall not be considered as drop connections.

2.3 Making Connections

Contractor shall connect the new sewer line to the existing manhole by cutting the walls benching and restoring them to the original condition. A new channel shall be cut in the benching of the existing manhole for the new connection. Contractor shall remove all sewage and water if encountered in making the connection without additional cost.

3. TESTING

All rights of the sewer and drain 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 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.

Sewer lines shall be tested for straightness by :

i. Inserting a smooth ball 12mm 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.

ii. Means of a mirror at one end a lamp at the other end. If the pipes is straight the full circle of light will be seen otherwise obstructions or deviations will be apparent.

iii. The contractor shall give a smoke test to the drain and sewer at his own expense and charges, if directed by the BRBNMPL's site representative.

iv. A test register shall be maintained which shall be signed and dated by contractor and BRBNMPL's site representative.

1. PIPE COLOUR CODE :

Sl. No.	Pipe Lines	Ground / Base Colour	First Colour Band	Second Colour Band
1.	Cooling water	Sea Green	French Blue	
2.	Boiler feed	Sea Green	Gulf Red	
3.	Condensate	Sea Green	Light Brown	
4.	Drinking Water (all cold water lines after filter)	Sea Green	French Blue	Single red
5.	Treated Water (Soft Water)	Sea Green	Light Orange	
6.	Domestic Hot Water	Sea Green	Light Grey	
7.	Compressed air upto 15/KG/sqcm	Sky Blue		
8.	Steam	Silver Grey		
9.	Drainage	Black		
10.	Gas	Canary Yellow		
11.	Oils Diesel (indicated by letterHSD/as applicable)	Light Brown		
12.	Medical Gases :			
	Air	Sky Blue	White Blacl	
	Oxygen	Canary yellow	White	
	Nitrous Oxide	Canary yellow	French Blue	
	Vaccum	Sky Blue	Black	

	Colour Code to Conform to IS:2379:1990			

PHE LIST OF APPROVED MAKES FOR EQUIPMENT & MATERIALS FOR BRBNMPL BANGALORE		
S.No.	Details of Materials / Equipment	Manufacturer's Name in Alphabetical order
1	a. Vitreous China Sanitaryware	Jaquar /Grohe /Kohler
2	b. WC Connectors	Jaquar /Grohe /Kohler
3	d. Concealed flush valve(I- flush valve)	Jaquar /Grohe /Kohler
4	Seat Cover (Heavy Duty)	Jaquar /Grohe /Kohler
5	Auto Urinal Flush System (Battery operated)	Jaquar /Grohe /Kohler
6	Hand Drier	Euronics/Kopal/Nova
7	CP Fittings	Jaquar /Parrywere/Kohler
8	Floor Drain Fixture & Channel Gratings	SIPCO/Nirali/Viega
9	C.P. Grating for Floor Trap	SIPCO/Nirali/Viega
10	Cast Iron Pipes & Fittings Manhole covers and frames	Gebrit/Valsir
11	a.As per IS:3989 (Pipes & Fittings)	BIC Calcutta/Kapilansh/NECO
12	b.As per IS:1729 (Manhole covers	BIC Calcutta/Kapilansh/NECO
13	c.As per IS:1536 (CILA pipe)	Electro Steel Calcutta/IISCO /Kesoram Calcutta/Kapilansh/General Tubes
14	d. CILA fittings	Kartar valves & fittings
15	PVC Pipe	Astral/Hindware/Ashirvad
16	PP Silenc Pipe	Astral/Hindware/Ashirvad
17	Drip Seal	Vinod Cement Co. Chandigarh (PJS-43)
18	GI pipe sealent	Henkel - LOCTITE 55
19	Pipe clamp & supports	Chilly/Euroclamp/Hira walraven
20	Gully Traps	Perfect Potteries, JABALPUR/Rajura/Approved equivalent ISI marked
21	CPVC Pipe	Astral/Hindware/Ashirvad
22	CHEM PRO CPVC Pipe	Astral/Ashirvad
23	SS Pipes & Fittings	JINDAL / TATA
24	SS Valves	Zoloto/NEO valves/advance
25	GM / Forged Brass Ball Valves	Zoloto/NEO valves /advance /RB/Leader
26	Sluice Valves	Indian Valve Company/Kirloskar
27	Butterfly Valve	Zoloto/NEO valves/advance
28	Wafer Type Check Valve	Zoloto/NEO valves/advance

29	Dual Plate Check Valve	Zoloto/NEO valves/advance
30	Pressure Reducing Valve	Zoloto/NEO valves/advance
31	Solenoid Valve	Avcon/Danfoss/Zoloto/NEO valves
32	Gate / Globe Valve	Zoloto/NEO valves/advance /RB/Leader
33	Air Release Valve	Zoloto/NEO valves/advance /RB/Leader
34	Ball Float Valve	Esseti/HBD/Zoloto/NEO valves
35	Y Strainer	Emerald /H Guru/Normex/RB/Zoloto
36	Transfer Pumps / Hydro-pneumatic System	Armstrong /Grundfos/Xylem/KSB
37	Storm Water / Sewage Handling Pumps	Armstrong /Grundfos/Xylem/KSB
38	Mechanical Seal	Burgmann/Sealol
39	Couplings (Tyre – Type)	Dunlop /Lovejoy
40	Anti Vibration Mounting & SS Exp. Joints	Dunlop/Kanwal Industrial Corporation/Resistoflex
41	Pressure Gauge	Emarald /Fiebig/H Guru
42	Insulation for Hot Water Pipes	Armacell - Armaflex/Eurobatex – Union Foam/K-Flex /A-Flex
43	Grease Trap	ACO/Wade
44	Water heater	AO Smith/Racold/Venus
45	Sensor	AOS system/Jaquar
46	Non return valve	Leader/Normex/RB/Zoloto/NEO valves
47	SFRC Cover	GPI
48	CI Grating	Neco
49	CP Grating	SYSCRAFTGLOBAL ENTERPRISES(SGE)/AQUA/SIPCO
50	Bevelled Edge Mirror	ATUL/Modi Guard
51	Welding Rods	ADOR/Advani/Cosmos/Esab
52	Fastner	Hilti/Fisher/Birla 3 M
53	Fire Sealant	Hilti/Fisher/Birla 3 M/Promat

CHAPTER -D: FIRE PROTECTION AND DETECTION SYSTEM

HAND HELD FIRE EXTINGUISHERS:

ABC TYPE DRY POWDER EXTINGUISHER:

The Extinguisher shall be filled with ABC grade 40 Mono Ammonium Phosphate 40% from any approved manufacturer.

The capacity of the extinguisher when filled with Dry Chemical Powder (First filling) as per Is 4308 Part II, shall be 5kg +/ 3%. –

The distribution of fire extinguishers to be as per IS: 2190-1992

It shall be operated upright, with a squeeze grip valve to control discharge. The plunger neck shall have a safety clip, fitted with a pin, to prevent accidental discharge. It shall be pressurized with Dry nitrogen as expellant. The Nitrogen to be charged at a pressure of 15 Kg/cm^2.

Body shall be of mild steel conforming to relevant Is Standards. The neck ring shall be also mild steel and welded to the body. The discharge valve body, shall be forged brass or leaded bronze, while the spindle, spring and siphon tube shall be of brass. The nozzle shall be of brass, while the hose shall be braided nylon. The body shall be cylindrical in shape, with the dish and dome welded to it. Sufficient space for Nitrogen gas shall be provided inside the body, above the powder filling.

The Neck Ring shall be externally threaded – the threading portion being 1.6cm. The filler opening in the neck ring shall not less than 50mm Discharge nozzles shall be screwed to the hose. The design of the nozzle shall meet the performance requirement so as to discharge at least 85% of contents up to a throw of 4 mtrs, continuously, at least for 15 seconds. The hose, forming part of discharge nozzle, shall be 500 mm long, with 10mm dia internally for 5 Kg capacity and 12mm for 10Kg capacity. It shall have a pressure gauge fitted to the valve assembly or the cylinder to indicate pressure available inside. The extinguisher shall be treated with anti-corrosive paint and it shall be labelled with words ABC 2.5cm long, within a triangle of 5cm on each face. The extinguisher body and valve assembly shall withstand internal pressure of 30 Kg/cm^2 for a minimum period of 2 minutes. The pressure gauge shall be imported and suited for the purpose.

WATER TYPE EXTINGUISHER:

The Extinguishing medium shall be primarily water stored under normal pressure, the discharge being affected by release of Carbon Dioxide Gas from a 120gms cylinder.

The capacity of Extinguisher, when filled up to the indicated level shall be 9 ltr +/ –5%

The skin thickness of the Cylinder shall be minimum 4.0mm fabricated from Mild Steel Sheet welded as required with dish and dome being of same thickness and of size not exceeding the diameter of body. The diameter of body to be not less than 150mm and not exceeding 200mm. The neck shall be externally threaded upto a minimum depth of 16mm and leaded tin bronze.

The cap shall be of leaded tin bronze and screwed on the body upto a minimum of 1.6 cm depth with parallel screw thread to match the neck ring. The siphon tube to be of brass or G.I. and the strainer of Brass. The cartridge holder, knob, discharge fittings and plunger to be of Brass/Leaded

tin bronze and plunger of stainless steel, spring of stainless steel. The cap to have handle fixed to it. The discharge hose shall be braided nylon, of stainless steel. The cap to have handle fixed to it. The discharge hose shall be braided nylon, of 10mm dia and 600mm long, with a nozzle of brass fitted at end.

The extinguisher shall be treated for anti-corrosion internally and externally, and externally painted with Fire Red paint. The paint shall be stove enamelled/powder coated. The cartridge shall be as per IS, and have 60gm net carbon dioxide gas for expelling. The extinguisher, body and cap shall be treated to an internal hydraulic pressure of 25 Kg/cm2. It shall have external marking with letter A, of 2.5cm height, in block letters within a triangle of 5cm each side. The extinguisher shall be upright in operation, with the body placed on ground and discharge tube with nozzle held in one hand to give a throw of not less than 6 mtr, and continue so for atleast 60 secs. The extinguisher body shall be clearly marked with ISI stamp (IS 940).

CARBON DIOXIDE EXTINGUISHER:

The Carbon Dioxide Extinguisher shall be as per IS: 2878

The body shall be constructed of seamless tube conforming to IS: 7285 and having a convex dome and flat base. Its dia shall be maximum 140mm, and the overall height shall not exceed 720mm.

The discharge mechanism shall be through a control valve conforming to IS: 3224. The internal syphon tube shall be of copper aluminum conforming to relevant specifications.

Hose pipe shall be high pressure braided Rubber hose with a minimum burst pressure of 140 Kg/cm^2 and shall be approximately 1.0 meter in length having internal dia of mm. The discharge horn shall be of high quality unbreakable plastic with gradually expanding shape, to convert liquid carbon dioxide into gas form. The hand grip of Discharge horn shall be insulated with Rubber of appropriate thickness.

The gas shall be conforming to IS:307 and shall be stored at about 85 Kg/cm^2 and shall be approximately 1.0 meter in length having internal dia of 10mm. The discharge horn shall be of high quality unbreakable plastic with gradually expanding shape, to convert liquid carbon dioxide into gas form. The hand grip of Discharge horn shall be insulated with Rubber of appropriate thickness.

The gas shall be conforming to IS: 307 and shall be stored at about 85 Kg/cm2. The expansion ratio between stored liquid carbon dioxide to expanded gas shall be 1:9 times and the total discharge time (effective) shall be minimum 10 secs and maximum 25 secs.

The extinguisher shall fulfill the following test pressures:
Cylinder: 236 Kg/cm2
Control Valve: 125Kg/cm2

Burst Pressure of Hose: 140 Kg/cm2 minimum

It shall be an Upright type. The cylinder, including the control valve and high pressure Discharge hose must comply with relevant Statutory Regulations and be approved by chief Controller of Explosives, Nagapur and also bear IS marking.

The Extinguisher including components shall be IS marked.

AUTOMATIC ADDRESSABLE ANALOGUE FIRE DETECTION SYSTEM (FIRE ALARM) SYSTEM DESCRIPTION

The specification covers requirements for the supply, installation, testing and commissioning of Microprocessor based analogue addressable intelligent fire detection & alarm system. The fire detection system shall comprise of a central unit, connected by two wires to field devices, including fire detection devices, alarm devices and control devices, located throughout the protected building area. The control unit shall continuously monitor the analogue status of all sensing devices, and initiate action when a fire or smoke condition is present. The system shall be designed to provide an early warning utilizing the most effective detection methods appropriate to the protected areas. In addition, preference should be given to sensors and sensing methods that are environmentally friendly, and that do not contain hazardous substances. The following is the order of preference for detection methods.

Multisensors, with optical smoke and thermal sensing
Optical smoke sensors
Thermal sensors

The alarm management shall be field configurable from the control panel via a key pad to enable the system to be tailored to suit the protected building, and to permit future changes. This configuration shall be maintained under power failure conditions. The system design shall conform to the BS 5839 code of practice. The control unit shall have a front panel comprising of indicating LED's, control keyboard, and LCD display, as described in detail later. Four levels of access into the system menu via the keypad are to be provided. These are to be as follows:

Level 1: Operator (no access code required)
Level 2: Maintenance Technician (access code required)
Level 3: Commissioning (access code plus key)
Level 4: Access code changes (access code plus key)

Facilities for "locking-off" controls are to be provided. The control unit and sensors shall have the following approval:

LPCB (Loss Prevention Certification Board)
VdS (Verband der Sacherversicherer)
UL (UNDERWRITERS LABORATORIES)
UL864 - Control Units for Fire Protective Signaling Systems
UL268 - Smoke Detectors for Fire Protective Signaling Systems
UL268A - Smoke Detectors for Duct Applications
UL217 - Smoke Detectors, Single and Multiple Station
UL521 - Heat Detectors for Fire Protective Signaling Systems.
UL228 - Door Closures/Holders for Fire Protective Signaling Systems.
UL464 - Audible Signaling Appliances
UL1638 - Visual Signaling Appliances
UL38 - Manually Actuated Signaling Boxes
UL346 - Water flow Indicators for Fire Protective Signaling Systems.
UL481 - Power supplies for Fire Protective Signaling Systems

The contractor shall be solely responsible for obtaining the required approval and clearance for the different components and systems of the fire detection and alarm system. The control unit and sensors shall conform to the following standards:

Control Unit EN54-2 (1998)
Smoke Sensors EN54-7 (1996)
Heat Sensors EN54-5 (1996)
Multisensors ISO7240-15 (Draft 1996)
Callpoints EN54-10 (Draft 1996)

All installations shall comply with current applicable provisions of NBC/NFPA and the following accessories:

Installation & Maintenance of Fire IS-2189-988
Detection & Alarm System
Detectors IS-2175-1988/11360-1985
Copper Wire IS-694-1977
Rubber Insulated Braided Wire IS-9968 (Pt-1)-1981
PVC Insulated Cables IS-1554 (Pt-1)-1976
NFPA71 - Central Station Signaling Systems - Protected Premises Unit
NFPA72A - Local Protective Signaling Systems - Protected Premises Unit
NFPA72D - Proprietary Signaling Systems - Protected Premises Unit
NFPA72E - Automatic Fire Detectors
National Electric Code Article 760

The fire alarm system shall be designed based upon I.S. codes or their Equivalent B.S. Codes. The approval / clearance certificates shall be furnished accordingly. It shall be the Contractor's responsibility to submit and obtain approval for the schemes for the fire detection and alarm system, prior to manufacture / installation.

2.0 System Operation:

2.1 Communication System:

The system is to incorporate a polling system which polls each sensor individually and reads information at regular intervals to the control unit. The idle value shall be continuously updated in order to compensate for ageing and atmospheric conditions. The panel shall make decisions based upon the information obtained from each detector. System polling time shall be less than three seconds for each complete scan of all devices attached. This time shall remain constant irrespective of the number of devices attached to the loop.

2.2 Communication circuit:

A 2-wire circuit is to be used for power and communication between the panel and the sensors. System control All communication shall be under the control of the control unit, which shall sequentially poll each device in turn and authorize communication. No device shall communicate with the control panel without authority. The control unit must be able to read information from a device or send instructions to a device.

2.3 Device address:

Each device on line must be uniquely identifiable by the control unit. This must be achieved by pre-setting the address of each device. Removal of a detector head from its base must transmit a fault condition to the control unit.

2.4 Device identification:

The identification of each type of address unit and each type of sensor (i.e. multisensor, ionization detector, heat detector, sprinkler switch, etc.) must be transmitted to the panel on each polling scan.

2.5 Device status:

The condition of each line device, including circuit, calibration and contamination, must be transmitted to the panel on each polling scan.

2.6 Calibration:

The system must check the calibration of each analogue line device and record changes caused by environmental contamination. When maximum calibration adjustment is reached the panel must indicate a "maintenance" signal. This must be a dedicated signal, and must be separate from the “pre-alarm” signal. The build-up of dirt or similar contamination on the optical surfaces will cause the output signal from the detector to gradually change. The control panel shall be capable of monitoring this slow change in signal and at a predetermined level indicate that the detector is in need of servicing.

2.7 Display and indicators:

All display and indicators shall be LCD for text, and LED for lamp indication. The type, calibration, sensitivity and status of each device must be able to be displayed at the control panel.

2.8 Number of devices in alarm:

There shall be no limit to the number of devices which may be in alarm simultaneously.
When a detector is in alarm an LED in its head or base shall be switched on.

2.9 Line protection and monitoring:

The addressable line must be monitored for short circuit or open circuit.The occurrence of an open circuit shall cause a fault signal on the panel, but all sensors or devices shall function correctly. The occurrence of a short circuit shall cause no more than 20 sensors or callpoints to cease operating, and all remaining devices shall function correctly.

3.0 Loop Operation:

3.1 Addresses:

The loop devices shall each have a unique address. Each device may be addressed as often as is required. There shall be no preset order for addressing the devices. The devices shall be addressed appropriate to site conditions. This order will be determined during system design or commissioning. Every device must be checked by the control panel every 2 seconds. In order to maintain system integrity, the panel must not bypass any sensors during a scan. The control panel will have the facility of determining if more than one device has the same address on the loop. A "double address" alarm shall be given if this occurs.

3.2 Loop devices:

It shall be possible to fit a range of sensors and devices to the loop, as indicated in detail later in this specification. Sensors shall transmit data to the control panel every 2 seconds, which shall be interpreted by the algorithm allocated to the particular sensor. Response shall be determined by the characteristics of the algorithm.

Manual call points shall each have their own unique address and the panel shall be capable of identifying and responding to the operation of a call point within three seconds, as required by BS5839 or similar Standards Loop sounders shall be powered directly from the addressable loop, without requiring any additional wiring. It shall be possible to fit up to 20 sounders onto each loop, depending on the size and length of the loop cabling. It shall be possible to fit loop isolators at a maximum spacing of one per 20 devices. The isolators shall protect against short circuits, and partial short circuits, on the loop by isolating that section of the loop where the short circuit occurred, thus maintaining the integrity of the remainder of the system. Fire condition LED indicators fitted to the devices and any remote indicators shall be remotely and separately operated from the control panel. Interfacing to other systems

The loop shall be capable of receiving information from third-party systems, e.g. operation of sprinkler system, by means of standard interface units. The source of this information shall be identified by its own unique address. In addition, the interface unit shall indicate to the panel the type of alarm, eg “sprinkler”, “security”, etc.

3.3 Device identification and location:

The control panel shall be able to identify what type of device is located at each address in order to protect against accidental fitting of an inappropriate sensor. The control panel shall be able to identify the absence of a field device. The control panel shall be able to physically identify the zone in which each sensor or device address resides, and shall give a “configuration-fault” signal if a sensor or device address is located in the incorrect zone.

3.4 Device monitoring:

The panel shall monitor each device on every scan, and give a fault signal for any of the following conditions, within 30 seconds.
Detector removed
Address unit removed
Incorrect device type
Faulty calibration or sensitivity.
Line capacity

The capacity of the address line shall be at least 127 addressable devices. These must be input devices, such as smoke sensors, or output devices, such as sounders or relays.

3.5 Floating Thresholds:

The alarm thresholds of each analogue detector shall vary individually in accordance with its idle status. This includes alarm thresholds, rate algorithms, pre-alarm and maintenance thresholds. When the threshold reaches its maximum limit, the panel must be able to indicate a "maintenance required" signal for the particular detector. This must be separate to a “prealarm” signal. The use of a combined signal for “pre-alarm/maintenance” is not acceptable.

4.0 Fire Alarm Panel:

The fire alarm panel shall be a 24 volt analogue addressable unit, designed to communicate with the sensors and field devices. It shall be a microprocessor based unit, and shall incorporate all hardware and software to enable it to make decisions based upon information received from sensors, and operate appropriate outputs to initiate required alarms and signals. The panel shall comply fully with standard EN54-2 and as per IS 2189 1988 or equivalent BS. The fire alarm panel shall be fabricated from 2mm thick sheet steel. All sheet steel shall be degreased, pickled, phosphated and then applied with two coats of zinc chromate primer and two coats of finishing paint both inside and outside as required by local fire authorities. The fire alarm panel shall have a degree of protection of IP-52. All doors, removable covers and plates shall be gasketted with neoprene gaskettes. Microprocessor based fire alarm panel shall comprise of the processor, various functional modules, adequate number of loop modules for detector loops, display devices, output modules for alarm control & interlocks, communication modules for interfacing etc., as required by the system to incorporate all the features called for in the specification.

4.2 Signalling and Annunciation:

Signalling and annunciation shall be as specified in standard EN54-2 Fire indication shall be by zone, displayed on LED indicators, and on the LCD text display. Fault, maintenance, pre-alarm, and device/zone disabled signals shall be indicated visually by LCD text display, and audibly, in the control unit. The top portion of the LCD text display shall always show the first alarm received. The lower portion of the LCD text display shall show the last alarm received. It must be possible to manually scroll through all alarms on the lower portion of the screen, using “up” and “down” scroll buttons. The display must show the total number of alarm events currently in the system. Fire alarms shall take priority when displaying. However, it must be possible to view all events currently in the system, including, fire alarms, fault alarms, pre-alarms, maintenance alarms, disabled devices, and other vents. It shall be possible to view the devices, by address that initiated the alarm on the LCD text display, on manual request. When viewing the device, a 40 character location message specific to each device shall be displayed. The visual indications must be arranged so that the different warnings are clearly distinguished. (i.e. amber for fault, red for alarm). The internal audible signal device may be the same for all alarms, but either tone variation or time switching shall be used to differentiate the signals. Outputs shall be provided for audible alarms, control functions, remote mimics and connection for computers and printers.

4.3 Zoning:

The panel shall have number of zones as required by site conditions (tenderer shall specify the number of zones). The zones must be fully field programmable to permit sensors to be allocated to any zone. Each zone shall be identified by a 40-character text label displaying on the LCD display. This shall be field programmable. It must be possible for any number of addressable devices from 0 - 128 to be connected to any zone. The zoning must be manually configured on system start-up, or on request by an authorized operator. The panel must provide facilities for the operator to inspect the zoning configuration, and inhibit, or activate devices. Facilities must be provided for identifying all active and inhibited addresses, and all connected device types.

4.4 Panel indicators:

All visual indicators shall be LED's and no incandescent lamps are to be used. The following LED's must be provided:
Zone alarm LED's
Supply healthy LED
Supply faulty LED
Common alarm LED's
Common fault LED

Maintenance LED (or visual display)
Processor running LED (internal)
Processor fault LED (external)
Panel displays

The LCD text display must be able to simultaneously display a minimum of the following information in each display mode.

4.5 Zone Display Mode:

Type of alarm
2 Zones (first and last)
Alarm count
Total number of alarms
40 Character zone location message for each zone
Time and date
4.6 Device Display Mode:

Loop number, zone number, detector address
Alarm count
Zone in alarm
Detector in alarm
Alarm type
Active or accepted
Time and date

4.7 The LCD must be at least a 160 character display:

Panel controls

The panel is to incorporate a keyboard and push-button with the following functions:

Numeric keyboard
System reset button
Alarm accept button / silence alarm button
Alarm sound button
Panel buzzer “mute” button
Lamp test function
“Help” button
Control buttons as required for system operation Menu functions for maintenance and commissioning.

A twenty-four column printer shall be available as an option, able to be installed into the panel, visible and accessible from the front. An optional facility shall be provided for connecting the panel to an Laser desktop printer. The printer shall provide a hard copy of the following:
Alarms

Faults.
Maintenance
Panel operations

4.8 Time and date:

Operation of the printer shall not inhibit, delay or affect the functioning of the detection polling system in any way. When supplied as an option, the printer must include all connecting cables, hardware, software and instructions.

4.9 Processor monitoring:

A hardware "watchdog" circuit must be provided on the central processor module. In the event of a microprocessor failure the watchdog must cause a hardware reset of the microprocessor. This reset action must continue until the processor has restarted. In the event that the processor will not restart within 20 seconds, then the panel must give an audible and visual alarm indication. A watchdog counter must allow the viewing of the number of times that the processor has been restarted by the watchdog, for diagnostic purposes. This information must be stored in non-volatile memory, enabling it to be viewed even if the panel has been powered down. The counter must only be able to be reset by an authorized engineer, under a level 3 access code. The microprocessor must perform full diagnostic tests on all memory devices on start-up, as follows.

RAM test (Running Data)
FLASH checksum verification (Programme Storage)
FLASH checksum verification (Site Configuration Storage)

Should any test fail an audible and visual fault indication must be given, and the LCD display must indicate the nature of the fault. The control unit shall perform periodic checksum tests, at intervals not exceeding 60 minutes, on the RAM and FLASH memories, and give an audible, visual, and LCD text fault indication in the event of a discrepancy. It must be possible to view the original and current checksums for all memories on the panel LCD display, as a maintenance (level 2) function.

5.0 Loop Devices:

5.1 Device types:

It shall be possible to connect the following detectors/devices to the control unit addressable loop.
Optical smoke sensors - analogue type
Ionisation smoke sensors - analogue type
Heat sensors - analogue type
Manual callpoint "break-glass" units
Multisensors - optical/thermal type
Addressable relays i.e. Output devices
Interface Units i.e. Input devices
Addressable Sounders (Loop powered)
Sounder Circuit Controllers
Addressable Remote LED Indicators

6.0 Multisensor sensors (analogue/addressable):

The multisensors must comply fully with the general requirements for intelligent point sensors. Multisensors shall comply with standard IS0 7240-15 for Enhanced Smoke Sensors. The multisensor sensors shall incorporate photoelectronic optical smoke sensors, and high sensitivity thermal sensors, software interlocked to provide early warning from all types of smoldering and thermal fires. Multisensors shall be able to be operated as enhanced smoke sensors (ISO7240 15),

as smoke sensors only (EN54-7), or as thermal sensors only (EN54-5). The smoke element shall be of the light scattering type using a pulsed internal LED light source and a photocell sensor. The thermal element shall utilise high sensitivity, high speed thermistors optimized to measure small changes in temperature, and rate of change. The elements shall measure both absolute smoke and thermal levels, but also rate of smoke and thermal change. The smoke and thermal elements must report independently to the control panel, and must be software interlinked to enable intelligent high-level decision making.

The detector shall be capable of operating within the following environmental limits.

a. Temperature operating range -20°C to +60°C
b. Humidity operating range 0% to 95% RH (without condensation)
c. Wind - not affected

The detector shall be capable of protecting an area up to 100m. At a height of up to 12m. The siting of the sensors must conform to BS5839 or similar Standards.

7.0 Heat sensors (analogue/addressable):

The heat sensors must comply fully with the general requirements for intelligent point sensors. Heat sensors shall comply with standard EN54-5.The heat detector shall be electronic in operation, and shall monitor ambient temperature by means of a NTC thermistor.

The detector shall be capable of operating within the following environmental limits.

a. Temperature operating range -20°C to +60°C
b. Humidity operating range 0% to 95% RH (excluding condensation)
c. Wind - not affected

Each detector shall be suitable for protecting an area up to 50 m. at a height of up to 7.5 m. The installation and siting of the sensors shall be carried out in accordance with standards BS5839 or similar Standards.

8.0 Manual call point:

The call point shall be manufactured from red injection moulded plastic. Manual call points shall comply with standard BS5839 .The overall size of the call point shall not exceed 100 mm x 100 mm x 60 mm. It shall consist of an enclosure, with a captive glass pane, and it shall incorporate an addressable communications module. Breaking the pane shall initiate an alarm, no secondary action shall be required by the operator. The call point shall incorporate a plastic-laminated safety glass which will not produce sharp edges when broken, thereby protecting the operator from injury. An externally visible LED must be incorporated to indicate when the device is in alarm. The LED shall illuminate when the call point is activated. However, the illumination of the LED will be by command from the control panel.

9.0 Alarm Management:

The annunciation and signaling outputs must be field programmable as described below.

9.1 Control outputs:

Optional control outputs or relays shall be available. The system must be able to support up to 768 optional relays. Each relay must be software programmable and must be able to be allocated to a loop device, a zone, fire alarm, and fault or coincidence operation. The optional relays must be able to be allocated in a different grouping or the same grouping as the zones. Each optional relay shall have a change-over voltage-free contact. Double - knock (coincidence) operation It shall be possible to programme any of the control outputs or addressable relays to operate upon an alarm from any two sensors in the programmed group.

9.2 Silencing operation:

It shall be possible to programme any of the control outputs or addressable relays to operate in either "silencing" mode or "non-silencing" mode. In "silencing" mode the relay or outputs shall de-activate when the "alarm accept" button is pressed, or when the "reset" button is pressed. In "non-silencing" mode, the relay or output shall be de-activated only when the "reset" button is pressed.

9.3 Activation delay:

It shall be possible to programme any of the control outputs or addressable relays to activate after a delay period from receipt of the control signal. This delay shall be 0 – 16 minute, in one second increments.

9.4 Software control:

All the above functions, shall be under software control, and programmed through the panels keyboard or by means of a computer. It must be possible, as an option, to programme the panel off-line on a computer, and download the programme into the panel. It must be possible to save the programme to disk for future reference.
10.0 System Maintenance:

The system shall be, as far as possible, self-testing and maintenance free. The control unit shall continually update the idle state of each detector, and indicate a "maintenance required" signal in the event of a detector sensitivity being too high or too low.

10.2 Control unit test:

The control unit shall have facilities for carrying out various diagnostic functions without interruption of the remainder of the system.

10.3 Detector tests:

The control unit shall allow for detector test and inspection by a single person. The test alarm triggered on each detector by the inspection person shall be indicated on the detector by a red LED and shall be automatically reset by the control unit. Alerting shall not take place. Zones which are not switched to maintenance mode shall remain ready for normal alarm procedure. Upon completion of the test, the panel shall print out a report indicating which sensors operated and any sensors which failed to operate.

10.4 Operational Statistics:

The control panel shall keep statistics for each of the system sensors. These statistics shall be able to be displayed on demand by a level 2 operator. The following statistics shall be displayed: Maximum value attained by the sensor as well as the date and time. The minimum value attained

by the sensor as well as the data and time. The average idle value attained by the sensor Communication error rate. It shall be possible to put up to 1 zone (20 detectors) in soak test mode. Sensors in soak test mode will log their conditions in the event buffer without raising fire alarms. It shall be possible to display or printout the result of the soak test.

10.5 Alarm test:

The control unit shall allow for the testing of all audible and visual alarm devices and control relays, to check correct functioning of these devices.

11.0 System wiring:

11.1 Loop Wiring Configuration:

The system device address loops shall each operate on a single two-wire circuit, which shall be normally screened to provide absolute reliability at all times, and in all environments. The system shall meet the requirements of European Union Directive CE336/89 for the ability to perform satisfactorily under conditions of electrical surges and transients, and shall comply fully with the requirements of the following standards as required by EN54.

IEC 801-2 Electrostatic discharges
IEC 801-3 Radiated Electro magnetic interference
IEC 801-4 Voltage transients – Fast transient bursts.

Wiring is to be suitable for return loop arrangement, or single direction arrangement. Teeoff's must be permitted, with full monitoring. When used with sensors, callpoints, and interface-units, the system shall operate satisfactorily with a loop length of up to 3500 metres, of a cable type and size as specified by the equipment manufacturer. When used with high-power devices, such as loop-powered sounders, in addition to sensors, callpoints, and interface-units, the system shall operate satisfactorily with a loop length of up to 1000 metres, of a cable type and size as specified by the equipment manufacturer. It shall be possible to carry out a high-voltage electrical test on a complete loop of cable, with the bases connected, but with sensor heads removed, without damage to any electronics.

12.0 PUBLIC ADDRESS SYSTEM:

The Public Address System is designed to serve the multi purpose of playing the music or to make general announcement or to transit the fire tone under fire condition. These different signals are transmitted through the same set of speakers hence different levels of priorities are allotted to different signals. The music is with the least priority and the fire tone is having next priority and the emergency announcements are having the highest priority level. For the purpose of Public Address System the park shall be divided in to zones grouped on to two groups as follows:

Group One: Office areas
Group Two: Lobbies, common areas
Group One i.e. Office areas shall have general announcement and paging services.
Group Two i.e. Lobbies lifts and other common areas shall have background music, general announcement and paging services. Control console shall be placed in the fire command center. Announcement and background music shall be played from the command center car calling mike shall be provided in the reception area.

The System shall have pre-recorded message to be announced in all the groups/zones in case of fire. A signal from fire alarm panel shall initiate such announcements. This announcement shall have highest priority. The system shall have a chime module. The chime module shall generate two types of signals consisting of either a two-note chime or a single gong tone to capture attention before paging. A DIP switch shall be provided on the P.C. board for selection of the chime or gong. Two LED indicators for the chime and paging function for the adjustment of the output level, two-note frequency and chiming interval. The chime shall be activated by a remote microphone and or through the amplifier. Normally background music shall be played in the lobbies, stair cases, smoke free lobbies, Toilets, Driver's Rest Room and other common areas paging will receive a higher priority and the highest priority shall be accorded to emergency announcements initiated by the fire control panel. The speakers are distributed in the entire facility and are configured in different zones. The announcement can be made in individual mode i.e. one zone at a time or to all the speakers simultaneously in ALL CALL mode. Public Addressing system comprising of

Wooden Cabinet / Metal Cabinet.
Ceiling ring speakers.
Public Addressing Amplifiers
Central Control Console

13.0 SPEAKERS:

Speakers are in wooden or metal enclosures. All the speakers are with its associated line matching transformers. The speakers are interconnected in the zone configurations. The types of speakers to be used in various areas are Common areas with false ceiling – 6 W flush mounting ceiling ring speakers Office areas – 6 W metallic/wooden cabinet speakers. These speakers shall have facilities for horizontal & vertical orientation and provision for easy installation.

14.0 PUBLIC ADDRESSING AMPLIFIERS:

These amplifiers are designed to accept the input sources i.e., Microphone/CD Player/Fire tone generator. The output is having a 100 Volts line to take care of line drop. The Amplifiers are stacked inside the rack system. Tone control circuit is provided to alter the quality of the output as per the users requirement.

14.1 RACK ASSEMBLY:

Rack assembly is to stack the public addressing amplifiers. This should be factory prewired and have different channels for AC mains cable and Audio signal Cables. The rack should be provided with wheels for easy maintenance. One lockable rear door should be provided. The rack assembly is operating on 230 VAC.

15.0 CONTROL CONSOLE:

The heart of the entire public addressing system is the Console. One microphone is given for announcements. The selection of Music or Announcements is done through the console. The system shall make provision for dual channel output i.e both music and audio announcement shall be made for the entire system in which either music or audio announcement shall be selected through a hardware or software switching facility. The announcements can be made through the control console zone wise such as Music, Fire tone or Announcements. The console is provided with keypads on a sloped surface. The switches are having respective LED's. The different modes of transmission in P.A System are as follows:

16.0 MUSIC:

The music is through the CD/ Players can be fed to the amplifiers. The music transmission is having the least priority. That is if FIRE condition occurs, then the Alert tone overrides the music in the speaker. If any announcement is made, then the music will be stopped till the time of announcement and continues after pressing key. To play music a separate switch MUSIC is given and by operating this switch, the music is transmitted to tall departments/zones.

17.0 ANNOUNCEMENTS:

Announcements can be made through the microphone and by selecting the required zones. Announcements can be made in following modes:

1. Individual mode
2. All Call mode

In this mode announcement can be made to all the speakers simultaneously. This is useful when any common message to be passed to all. Also this is more convenient and fast to address the people during emergencies.

GENERAL TECHNICAL SPECIFICATIONS OF FIRE FIGHTING & PROTECTION

LIST OF BUREAU OF INDIAN STANDARDS CODES

All equipment, supply, erection, testing and commissioning shall comply with the requirements of Indian Standards and code of practices given below as amended up to 30th April, 2021. All equipment and material being supplied by the contractor shall meet the requirement of IS. Tariff advisory committee's regulation (fire insurance), electrical inspectorate and Indian Electricity rules and other Codes / Publications as given below:

1. General

    1. Fire Fighting Equipment

TAC	Tariff Advisory Committee fire protection manual Part –1
NFPA : 12, 1993	Standards on Carbon Dioxide Extinguishing System
IS : 636	Non-percolating flexible fire fighting delivery hose.
IS : 884	Specification for first aid hose reel for fire fighting.
IS : 901	Specification for couplings, double male and double female, instantaneous pattern for fire fighting.
IS : 902	Suction hose couplings of fire fighting purposes.
IS : 903	Specification for fire hose delivery couplings, branch pipe, nozzles and nozzle spanner.
IS : 904	Specification for 2-way and 3-way suction collecting heads for fire fighting purposes.

IS : 907	Specification for suction strainers, cylindrical type for fire fighting purposes.
IS : 908	Specification for fire hydrant stand post type.
IS : 909	Specification for underground fire hydrant sluice valve type.
IS : 910	Specification for portable chemical foam fire extinguisher.
IS : 933	Specification for portable chemical foam fire extinguisher.
IS : 1648	Code of practice for fire safety of building (general) : Fire fighting equipment and its maintenance.
IS : 2171	Specification for portable fire extinguishers dry powder (cartridge type)
IS : 2190	Selection, installation and maintenance of first aid fire extinguishers-code of practice.
IS : 2871	Specification for branch pipe, universal, for fire fighting purposes.
IS : 2878	Specification for fire extinguishers, carbon dioxide type (portable and trolley mounted).
IS : 3844	Code of practice for installation and maintenance of internal fire hydrants and hose reel on premises.
IS : 5290	Specification for landing valves.
IS : 5714	Specification for coupling, branch pipe, nozzle, used in hose reel tubing for fire fighting.
IS : 8423	Specification for controlled percolation type hose for fire fighting.
IS : 10658	Specification for higher capacity dry powder fire extinguisher (trolley mounted).
IS : 11460	Code of practice for fire safety of libraries and archives buildings.
IS : 1309	External hydrant systems – Provision and maintenance – Code of practice.
IS : 5514 (Parts 1-7)	Reciprocating internal combustion engines : Performance.

LIST OF BUREAU OF INDIAN STANDARDS CODES

All equipment, supply, erection, testing and commissioning shall comply with the requirements of Indian Standards and code of practices given below. All equipment and material being supplied by the contractor shall meet the requirement of IS. Electrical inspectorate and Indian Electricity rules and other Codes / Publications as given below:

1. General

SP : 6(1)	Structural Steel Sections
IS : 27	Pig Lead
IS : 325	Three Phase Induction Motors
IS : 554	Dimensions for pipe threads where pressure tight joints are required on the threads.
IS : 694	PVC insulted cables for working voltages upto & including 1100V.
IS : 779	Specification for water meters (domestic type).
IS : 782	Specification for caulking load.
IS : 800	Code of practice for general construction in steel
IS : 1068	Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium.
IS : 1172	Code of Basic requirements for water supply drainage and sanitation.
IS : 1367 (Part 1)	Technical supply conditions for threaded steel fasteners : Part 1 introduction and general information.
IS : 1367 (Part 2)	Technical supply conditions for threaded steel fasteners : Part 2 product grades and tolerances.
IS : 1554 (Part 1)	PVC insulated (heavy duty) electric cables : Part 1 for working voltages upto and including 1100 V.
IS : 1554 (Part 2)	PVC insulated (heavy duty) electric cables : Part 2 for working voltages from 3.3 KV upto and including 11KV.
IS : 1726	Specification for cast iron manhole covers and frames.
IS : 1742	Code of practice for building drainage.
IS : 2064	Selection, installation and maintenance of sanitary appliance code of practice.
IS : 2065	Code of practice for water supply in buildings.
IS : 2104	Specification for water meter for boxes (domestic type)
IS : 2373	Specification for eater meter (bulk type)
IS : 2379	Colour code for identification of pipe lines.
IS : 2527	Code of practice for fixing rainwater gutters and down pipes for roof drainage.
IS : 2629	Recommended practice for hot dip galvanizing on iron and Steel.

IS : 3114	Code of practice for laying of cast iron pipes
IS : 4111 (Part 1)	Code of practice for ancillary structures in sewerage system :Part 1 manholes.
IS : 4127	Code of practice for laying glazed stoneware pipes.
IS : 4853	Recommended practice for radiographic inspection of fusion welded butt joints in steel pipes.
IS : 5329	code of practice for sanitary pipe work above ground for buildings.
IS : 5455	Cast iron steps for manholes.
IS : 6159	Recommended practice for design and fabrication of material, prior to galvanizing.
IS : 7558	Code of practice for domestic hot water installations.
IS : 8321	Glossary of terms applicable to plumbing work.
IS : 8419 (Part 1)	Requirements for water filtration equipment : Part 1 Filtration medium sand and gravel.
IS : 8419 (Part 2)	Requirements for water filtration equipment : Part 2 under drainage system.
IS : 9668	Code of practice for provision and maintenance of water supplies and fire fighting.
IS : 9842	Preformed fibrous pipe insulation.
IS : 9912	Coal tar based coating materials and suitable primers for protecting iron and steel pipe lines.
IS : 10221	Code of practice for coating and wrapping of underground mild steel pipelines.
IS : 10446	Glossary of terms relating to water supply and sanitation.
IS : 11149	Rubber Gaskets
IS : 11790	Code of practice for preparation of butt-welding ends for pipes, valves, flanges and fittings.
IS : 12183 (Part 1)	Code of practice for plumbing in multistoried buildings : Part 1 water supply.
IS : 12251	Code of practice for drainage of building basements.
IS : 5572	Code of practice for sanitary pipe work.

BS : 6700	Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their cartilages.
BS : 8301	Code of practice for building drainage.
BSEN : 274	Sanitary tap were, waste fittings for basins, bidets and baths. General technical specifications.

2. Pipes and Fittings

IS : 458	Specification for precast concrete pipes (with and without reinforcement)
IS : 651	Salat glazed stone ware pipes and fittings.
IS : 1239 (Part 1)	Mild steel, tubes, tubular and other wrought steel fittings : Part 1 Mild Steel tubes.
IS : 1239 (Part 2)	Mild Steel tubes, tubular and other wrought steel fittings : Part 2 Mild Steel tubular and other wrought steel pipe fittings.
IS : 1536	Centrifugally cast (spun) iron pressure pipes for water, gas and sewage.
IS : 1537	Vertically cast iron pressure pipes for water gas and sewage.
IS : 1538	Cast Iron fittings for pressure pipes for water, gas and sewage.
IS : 1729	Sand Cast iron spigot and socket soil, waste and ventilating pipes, fittings and accessories.
IS : 1879	Malleable cast iron pipe fittings.
IS : 1978	Line pipe
IS : 1979	High test line pipe.
IS : 2501	Copper tubes for general engineering purposes
IS : 2643 (Part 1)	Dimensions for pipe threads for fastening purposes : Part 1 Basic profile and dimensions.
IS : 2643 (Part 2)	Dimensions of pipe threads for fastening purposes : Part 2 Tolerances.
IS : 3468	Dimensions for pipe threads for fastening purposes : Part 3 Limits of sizes.
IS : 3468	Pipe nuts.
IS : 3589	Seamless or electrically welded steel pipes for water, gas and sewage (168.3 mm to 2032 mm outside diameter).

IS : 3989	Centrifugally cast (sun) iron spigot and socket soil, waste and ventilating pipes fittings and accessories.
IS : 4346	Specifications for washers for use with fittings for water services.
IS : 4711	Methods for sampling steel pipes, tubes and fittings.
IS : 6392	Steel pipe flanges
IS : 6418	Cast iron and malleable cast iron flanges for general engineering purposes.
IS : 7181	Specification for horizontally cast iron double flanged pipe for water, gas and sewage.

3. Valves

IS : 778	Specification for copper alloy gage, globe and check valves for water works purposes.
IS : 780	Specification for sluice valves for water works purposes (50 mm to 300 mm size).
IS : 1703	Specification copper alloy flat valves (horizontal plunger type) for water supply fittings.
IS : 2906	Specification for sluice valves for water works purposes (350mm to 1200mm size)
IS : 3950	Specification for surface boxes for sluice valves.
IS : 5312 (Part 1)	Specification for swing check type reflux (non return) valves:Part2 Multi door pattern.
IS : 5312 (Part 2)	Specification for swing check type reflux (non return) valves:Part2 Multi door pattern.
IS : 12992 (Part 1)	Safety relief valves, spring loaded : Design
IS : 13095	butterfly valves for general purposes.

4. Sanitary Fittings

IS : 771 (Part 1 to 3)	Specification for glazed fire clay sanitary appliances.
IS : 774	Specification for flushing cistern for water closets and urinals (other than plastic cistern)
IS : 775	Specification for cast iron brackets and supports for wash basins and sinks.

IS : 781	Specification for cast copper alloy screw down bib taps and stop valves for water services.
IS : 1700	Specification for drinking fountains.
IS : 2548 (Part 2)	Specification for plastic seats and covers for water closets : Part 1 Themoset seats and covers.
IS : 2556 (Part 1)	Specification for vitreous sanitary appliances (Vitreous china) : Part 1 General requirement.
IS : 2556 (Part 2)	Specification for vitreous sanitary appliances (Vitreous china) : Part 2 Specific requirements of wash-down water closets.
IS : 2556 (Part 3)	Specification for vitreous sanitary appliances (Vitreous china) : Part 3 Specific requirements of squatting pans.
IS : 2556 (Part 4)	Specification for vitreous sanitary appliances (Vitreous china) : Part 4 Specific requirements of wash basins.
IS:2556 (Part 6 Sec 2)	Specification for vitreous sanitary appliances (Vitreous china) : Part 6 Specific requirements of urinals, section 2 half stall urinals.
IS:2556 (Part 6 Sec 4)	Specification for vitreous sanitary appliances (Vitreous china) : Part 6 Specific requirements of urinals, section 4 partition slabs.
IS:2556 (Part 6 Sec 5)	Specification for vitreous sanitary appliances (Vitreous china) : Part 6 Specific requirements of urinals, section 6 water spreaders for half stall urinals.
IS : 2556 (Part 7)	Specification for vitreous sanitary appliances (Vitreous china) : Part 7 Specific requirements of half round channels.
IS : 2556 (Part 8)	Specification for vitreous sanitary appliances (Vitreous china) : Part 8 Specific requirements of siphoning wash down water closets.
IS : 2556 (Part 11)	Specification for vitreous sanitary appliances (Vitreous china) : Part 11 Specific requirements for shower rose.
IS : 2556 (Part 12)	Specification for vitreous sanitary appliances (Vitreous china) : Part 12 Specific requirements for floor traps.
IS : 2556 (Part 15)	Specification for vitreous sanitary appliances (Vitreous china) : Part 15 Specific requirements of universal water closets.
IS : 2692	Specification for ferrule for water services.
IS : 2717	Glossary of terms relating to vitreous enamelware and ceramic metal systems.
IS : 2963	Specification for waste plug and its accessories for sinks and wash basins.

IS : 3311 Specification for waste plug and its accessories for sinks and wash basins.

IS : 5961 Specification for cast iron gratings for drainage purposes.

IS : 6249 Specification for gel-coated glass fibre reinforced polyester resin bath tubs.

IS : 6411 Specification for gel-coated glass fibre reinforced polyester resin bath tubs.

IS : 8931 Specification for copper alloy fancy single taps, combination tap assembly and stop valves for water services.

IS : 9758 Specification for flush valves and fitting for water closets and urinals.

5 Water Quality Tolerance

IS : 3025 (Parts 1- 44) Method of sampling and test (physical & chemical) for water and waste water.

IS : 4764 Tolerance limits for sewage effluents discharged into inland surface waters.

IS : 10500 Drinking Water.

6. Pumps & Vessels

IS : 1520 Specification for horizontal centrifugal pumps for clear cold fresh water.

IS : 2002 Steel plates for pressure vessels for intermediate and high temperature service including boilers.

IS : 2825 Code for unfired pressure vessels.

IS : 4648 (Part 1) Code of practice for lining of vessels and equipment for chemical processes Part 1 : Rubber lining.

IS : 5600 Specification for sewage and drainage pumps

IS : 8034 Specification for submersible pump sets for clear, cold, fresh water.

IS : 8418 Specification for horizontal centrifugal self priming pumps.

	FIRE MAKE OF EQUIPMENT FOR BRBNMPL BANGALORE	
	FIRE DETECTION AND ALARM WITH P.A. SYSTEM	
1	SMOKE DETECTORS	SIMPLEX /NOTIFIER/MIRCOM
2	HEAT DETECTORS	SIMPLEX /NOTIFIER/MIRCOM
3	MAIN CONTROL PANEL	SIMPLEX /NOTIFIER/MIRCOM
4	MANUAL PULL STATIONS	SIMPLEX /NOTIFIER/MIRCOM
5	HOOTERS / STROBES	SIMPLEX /NOTIFIER/MIRCOM

6	MODULES	SIMPLEX /NOTIFIER/MIRCOM
7	BATTERY	EXIDE / STANDARD / MINIMAX
8	COPPER CONDUCTOR CONTROL CABLE / WIRES	
9	FIRE SURVIVAL CABLES	POLYCAB/VARSHA ASSOCIATES/DEEPANJAN
10	M S CONDUITS	BHARATH / GB / PRINCE
11	PVC CONDUITS	VIP / PRECISION / NELCO
12	P.A. SPEAKERS	HONEYWELL/BOSCH /AYZO/HEINRICH
13	P.A.CONSOLE & CONTROLLER	HONEYWELL/BOSCH / AYZO/HEINRICH
14	P.A. AMPLIFIERS	HONEYWELL/BOSCH / AYZOHEINRICH
15	SIGNAGES	EATON/ PROLITE

CHAPTER -E: INTERIOR WORKS

SECTION – 1: INTERIOR & FURNISHING WORKS-GENERAL

1. General: -

The scope of work covers execution of the Interior, Finishes, Services and Allied works for Corporate office Building Project at BRBNMPL, Bengaluru, in accordance with the BOQ, Technical Specifications & drawings provided in the Tender Documents and to the satisfaction of the EIC/Architect.

Unless provided otherwise the work shall be executed as per CPWD specifications 2019 Volume I & II with up to date amendments, and correction. All relevant Indian Standard (IS) codes related to items of work shall be completely followed for execution.

2. Drawings:

Two sets of all drawings shall be furnished to the contractor by the Architect for his own use to be kept at site office for reference & execution of works till the completion of the project in all respect. It shall be accessible at all reasonable times to the EIC/Architect and their representatives. All-important drawings are to be mounted on boards and placed in racks and indexed.

3. Dimensions:

Figured dimensions are in all cases to be followed & accepted in preference to scaled sizes. Large- scale details take precedence over small-scale drawings. In case of discrepancy the Contractor is to ask for clarification before proceeding with the work. The decision of EIC/Architect shall be final and binding.

4. Contractor to inspect site:

The contractor shall visit and examine the construction site and satisfy himself as to the nature of the existing roads or other means of communications, the extent and magnitude of the work and facilities for obtaining materials and shall obtain generally his own information of all matters affecting the execution of the project. Misunderstanding or incorrect information on any of these points or on expenses incurred by the contractor in connection with obtaining site data/information or efforts in compiling the tender shall be borne by the Tenderer/Contractor and no claims for reimbursement thereof shall be entertained.

4.1 Access to Site:

The Contractor is to include in his rates for making access to the site, with all-temporary gangways, access platforms etc. as required for execution and completion of the works.

4.2 Setting Out:

The Contractor shall set out the works in accordance with the plans. All grid/centre lines shall be pegged out to the satisfaction of the EIC/Architect. The Contractor shall be responsible for the correctness of lay out and any inaccuracies to be rectified at his own expense.

The Contractor shall construct and maintain proper benches at the intersection of all main walls, columns etc; in order that the lines and levels may be accurately checked at all times.

4.3 Treasure Trove:

Should any treasure, fossils, minerals, or works of art of antiquarian interest be found during excavation or while carrying out the works, the Contractor shall give immediate

notice to the Engineer of any such discovery and shall hand over such finds to the BRBNMPL immediately.

4.4 Access for Inspections:

The contractor is to provide at all times during the progress of the works and the Maintenance period proper means of access, with ladders, gangways etc. and the necessary attendance to move and adapt as directed for the inspection or measurement of the works by the EIC/Architect or their representatives.

4.5. Attendance upon all Trades:

It will be the responsibility of the main Contractor to attend on all Tradesman or Sub-contractors for other services not included in scope of contract i.e. for water supply, security Equipment, hardware, Telephone, Water bore well and other specialist Sub-Contractors. The rates quoted shall be inclusive of all attendance and also allow the other Contractors appointed by the BRBNMPL for other contract packages.

4.6 Gate Keeper and Watchmen:-

4.6.1 The Contractor from the time of being placed in possession of the site must make arrangements for watching, lighting and protecting the work, all materials, workmen and the public during day and night on all days including Sundays and holidays at his own cost.

4.6.2 Before starting the work the contractor shall intimate to the EIC/Architect the number and names of works and other personnel together with a copy of each identity card with photograph along with a list of tools, tackles and construction materials for obtaining respective inward gate pass, in triplicate, one for the gate office, one for the Engineer representative and the other for the contractor. The contractor shall be permitted similar outward pass on completion of work and on submission of contractor's copy of same inward pass.

4.6.3 The contractor shall apply for gate passes for taking out any materials, tools, tackles etc. brought by him inside the BRBNMPL premises based on contractor's copy of inward pass and also for his personnel going out of the BRBNMPL premises.

4.6.4 The contractor shall be responsible for any unauthorized removal of materials, tools, tackles etc. from the BRBNMPL premises.

4.6.5 BRBNMPL gate office norms to be followed.

5. Storage for Materials:-

The Contractor shall provide for all necessary sheds of adequate dimension for storage and protection of materials like cement, lime, timber and such other materials including tools and equipment which are likely to deteriorate by the action of sun wind, rain or other natural causes due to exposure in the open. For cement the contractor shall arrange for leak proof godown of sufficient size to store not less than 3 months requirement of cement.

All such sheds shall be cleared away and the whole area left in good order on completion of the contract to the satisfaction of the EIC/Architect.

All materials, which are stored on the site such as bricks, aggregates etc., shall be stacked in such a manner as to facilitate rapid and easy checking of quantities of such materials.

6 Cost of Transporting:-

The Contractor shall allow at his cost for all transporting, unloading, stacking and storing of supplier of goods and materials for this work on the site and in the places approved from time to time by the EIC/Architect. The Contractor shall consider in his price for transport of all materials controlled or otherwise to the site.

7. W.C. and Sanitary Accommodation and Office Accessories and Accommodations:-

The Contractor shall provide at his own cost and expense adequate water closet and sanitary accommodation complying in every respect to the rules and regulations in force of the EIC/Architect, for his workmen, for the workmen of sub-contractors, Architect and other Contractor's agents connected with this building project and maintain the same in good working order.

He shall arrange to provide a Dumpy level/Theodolite and at all times maintain in good working order at site, to enable the EIC/Architect to check the lines and levels of the work.

8. Materials, Workmanship and Samples:-

Samples of materials to be used with original/coloured catalogue with specification shall be brought by Contractor well in advance and shall be displayed and kept in separate sample room on site. Samples of all kind of material to be used shall be getting approved from EIC/Architect. Materials shall be of approved quality and the best of their kind available and shall generally conform to I.S. Specifications. The Contractor shall order all the materials required for the execution of work as early as necessary and ensure that such materials are on site well ahead of requirement for use in the work. The work involved calls for high standard of workmanship with accelerated progress to the entire satisfaction of the EIC/Architect.

8.1 Rate to Include:-

The Rates quoted shall be for all lead, heights and depths and for finished work complete in all respect and to the satisfaction of EIC/Architect until it is specifically mentioned in the item itself.

8.2 To ascertain from Contractors for the other trades:-

The Contractor shall ascertain from other Contractors as directed by the Engineer all particulars relating to their work with regard to the order of its execution and the position in which chases, pockets, holes and similar items will be required, before the work is taken in hand as no claims for extras will be allowed for cutting away work already executed in consequence of any neglect by the Contractors to ascertain these particulars beforehand.

9. Foreman and Tradesman:-

All Tradesmen shall be experienced men properly equipped with suitable tools for carrying out all the work of carpentry and joinery and other specialist trades in a first class manner and where the EIC/Architect deem necessary, the Contractor shall provide any such tools, special or ordinary, which are considered necessary for carrying out of the work in a proper manner.

All such tradesman shall work under an experienced and properly trained Foreman, who shall be capable of reading and understanding all drawing, pertaining to this work and the Contractor shall also comply with other conditions set out in the General Conditions of the Contract.

10. Work Programme/Weekly Progress Report:-

The Contractor shall prepare and submit to EIC/Architect for approval, a CPM chart showing the programme of construction of various items, fitted within the period stipulated for completion, within 30 days of the communication of the acceptance of Tender. The Contractor shall also furnish necessary particulars monthly progress reports in the form furnished by the EIC/Architect. Approved programme shall be the basis for monitoring the progress of work. The Contractors also should up date and re-analyze the CPM chart as often as required as per direction of EIC/Architect to assess and reassess the progress of work done and take corrective measures for making out any deficiency.

11. Clearing of site:-

The contractor shall immediately after completion of the work clear the site of all debris and left over materials at his own expense to the entire satisfaction of the EIC/Architect and Municipal or other public authorities. Before taking out any surplus material, reconciliation of materials shall be submitted by the contractor for approval. For taking out the materials, the contractor shall strictly follow the provisions laid down in General Specifications and/or any subsequent circulars that may be issued by BRBNMPL.

12. Preparation of Building for occupation and use on Completion:-

The whole of the work shall be thoroughly inspected by the Contractor and all deficiencies and defects put right. On completion of such inspection, the Contractor shall inform the EIC/Architect in writing that he has finished the work and it is ready for the inspection.

On completion, the Contractor shall clean all windows and doors and all glass panes, including cleaning of all floors, skirting, dados, staircases and every part of the building including oiling all hardware. He will leave the entire building neat and clean and ready for immediate occupation and to the satisfaction of the EIC/Architect.

13. Contractor to Provide Sign Board:-

The Contractor shall provide notice on proper supports 3 m x 2 m (10' x 6') in a position approved by the EIC/Architect. He shall allow for painting and lettering stating name of work, name of Architect, Structural Consultants; General Contractor and Sub-Contractors, all letters except that of the name of the work shall be in letters to the approval of the EIC/Architect. He will also display safety notices as per requirement and direction of EIC/Architect.

14. Vouchers:-

The Contractor shall furnish the EIC/Architect with vouchers on request to prove that the materials are as specified in contract and for non tender items to indicate the rate at which the materials are purchased in order to work out the rate analysis of the non-tender items which he may be called upon to carry out.

15. Protection:-

The Contractor shall properly cover up and protect all work throughout the duration of work until completion, particularly masonry/finish, moulding, steps, terrazzo or special floor finishes,staircase and balustrades, doors and window frames, plaster angles, lighting and sanitary fittings, glass, paint work and all finishing works.

16. Workmanship: -

16.1 The workmanship is to be the best possible and of a high standard. The contractor shall take all steps immediately to make up deficiency if any noticed

by the EIC/Architect. Use must be made of special tradesmen in all aspects of the work and allowance must be made in the rates for the same.

16.2 Contractor shall maintain uniform quality and consistency in workmanship throughout the execution of the work.

16.3 The contractor shall be responsible for providing and maintaining temporary coverage required for the protection of finished work. He is also to clean out all wood shavings; cut ends and other waste from all parts of the works before covering of infillings are constructed.

17. The EIC/Architect shall have full powers and authority to issue such instructions as to the order of proceeding with or carrying out the work as he may deem necessary for the guidance of the Contractor and contractor shall be bound by such instructions of the EIC/Architect.

18. The levels and measurements of the existing site, as shown in the drawings, are believed to be correct, but the Contractor should verify them for himself. No claim or allowance whatsoever will be entertained hereafter on account of any errors or omission in the description of the site turning out different from what was expected or shown in the drawings.

19. All floors, paving, staircase, etc. are to be scrubbed, all glasses to be cleaned on both sides of windows/curtain wall including its members, screens, doors, sky-lights, roof lights, etc., all gulley, gutters, pipe heads, etc. to be cleaned out and the premises left clean, perfect and water tight upon completion. However, a proper care needs to be taken during such cleaning works that the original finishing such as polishing, painting, anodizing, powder coating etc. are not scratched/damaged. In case of any such damage, the contractor shall have to reinstate the same as original as per the instructions of EIC/Architect, without any cost to Employer.

20. Any loss or damage caused due to fault or negligence on the part of Contractors labours, staff etc. during working in the premises will be made good by contractor at no extra cost or the damage and repair cost will be reimbursed in full to the Employer.

SECTION – 2: TECHNICAL SPECIFICATIONS FOR INTERIOR AND FURNISHING WORKS

1.1 The Contractor shall furnish for approval, with reasonable promptness, samples of materials and workmanship as diected. The EIC/Architect shall check and confirm in consultation with Architect / Consultants, approval of such samples with reasonable promptness only to conform with the design concept of the Works and for compliance with the information given in the contract documents. The work shall be in accordance with approved samples. The procedure for submission and approval of samples shall be as follows; -

a) All material samples in duplicate shall be delivered to the Engineer-in-charge/ BRBNMPL's office at the Contractor's cost. Samples shall be properly labeled with.

- Name of Project
- Name of Contractor
- Name Product
- Name of Manufacturer
- Reference No of Schedule of Quantities (BOQ)
- Date of Submission
- Date of fabrication / casting – if applicable

b) Samples shall be accompanied with technical specification / manufacturer's catalogue

c) In case the Contractor intends to keep an approved sample in his possession he shall submit one additional samples for the Engineer's/BRBNMPL's approval.

d) Samples shall be furnished well in advance to give the EIC/Architect reasonable time for their consideration.

2. WOODEN FLOORING:

2.1 Material Properties: -

The material shall have a wear resistance surface abrasion resistance, impact resistance, indentation resistance, resistance to rolling castors, resistance to furniture legs, stain resistance, resistance to burning cigarettes, slip resistance and resistance to color fading. Apart from the above properties, the material shall have following additional properties: -

Dimensional Stability : Less than 0.9 mm
Surface Soundness : More than 0.8 N per sq.
mm Impact Resistance : IC 2 as per EN
13329 Thickness Swelling : Less than 12%.

2.2 Material Storage & Pre-requisites: -

The material shall be stored in unopened packages at normal room temperature at least 0.5 m away from the walls, for at-least 48 hours prior to the installation. The contractor shall ensure that the boards are undamaged

and free from any faults before installation. The contractor shall use felt pads and castor cups on furniture legs and provide external doormats inside all the external doorways to protect the floor at the time of handover. A maintenance guide of the approved company shall be made available any time and handed over to the client at the time of handover.

2.3 Installation

The normal method of installation of laminated wooden flooring is in a random installation pattern taking into consideration the type of installation pattern desired for the purpose of aesthetics or any technical reasons. The joinery is tongue & grooved in an interlocking pattern including beading at the end. A teak moulding shall be provided and installed at the joinery junction of the wall and the floor as per the approved manufacturer's specifications. The quoted rate shall be inclusive of levelling and laying. Underlay shall be provided as per manufacturer specification.

It is important to ensure the sub floor on which the laminate is being laid is smooth, flat & hard & free from moisture, grease, etc. In case of uneven sub floor the same should be levelled if required by self-levelling compound to be paid separately. There should be no moisture or the moisture level present in the subfloor should be less than 10% before installation of the floor. The laminate shall have Unilin/click locking system. It is recommended to use underlay having water barrier of 250 microns and 2mm polyethylene foam under the planks. The installation shall be undertaken as per the manufacturer's installation instructions.

2.4 Measurements: -

Length and breadth of superficial area of the finished work shall be measured correct to a cm. The area shall be calculated in square metre correct to two places of decimal. No deduction shall be made nor extra paid for voids not exceeding 0.20 square metre. Deductions for ends of dissimilar materials or other articles embedded shall not be made for areas not exceeding 0.10 square metres. The rate shall include the cost of the labour, T&P and materials involved in all the operations described above.

3. CARPET TILES

Carpet tiles of Yarn type Eco Solution Nylon 6 only; Multi-Level Pattern Loop, manufactured using 100% solution dyeing process, Tiles of size approx 60 cms x 60 cms with Soil Protection treatment containing properties of Stain Repel, with 100% PVC Free / 100% Bitumen Free/ 100% Recyclable - backing system with recycled content, made from thermoplastic polyolefin compound with reinforcing layer high- performance environments requiring modular flooring, having tufted yarn weight of 18 oz and average yarn density of Minium 7385 oz/cu. yd. or more, Nominal total thickness 5.79 mm minimum, Radiant Panel class 1rated (ASTM E648) , NBS smoke < 450, Pill test -Passed, Anti Static Property less Than 3.5 kv, Texture Appearance Retention Rating of 3.5 for Severe Use, Anti Microbial Treatment-Passes (AATCC-174). CRI Green Label Plus certified for indoor air quality, including fixing/ installation with Low/ Zero VOC content Adhesive. Impact Sound (ISO 10140-3) 20 dB & Sound absorption (ISO 354) 0.2 Class D.Environmental Certifications- Cradle to Cradle Silver Certified standard Version 4.0 +Declare LBC Complian + LEED V4 compliance+ EPD + HPD+ NFS 140 Gold+ CRI Green Lable

Plus.

3.1 ENTRY MAT

Entry Mat of approved make, shade and pattern with enhanced drainage system, to be laid on semi-wet areas and vestibular area with stone flooring. The entrance matting should be Heavy Duty and slow wearing with enhanced absorption. Construction to be looped pile carpet design with solid vinyl backing. The material of the looped pile to be Polypropylene and Nylon and the backing to be vinyl. Size to be measured at site and be pre-cut at source to fit at the site.

4. PVC VINYL FLOORING

6mm thick PVC Vinyl flooring with foam backing, vinyl floor covering of size 1200 mm width x 6 metres length of weight 4400 g/m2 with wear layer thickness of 1 mm. Wear layer should be treated with Protocol (UV cured Polyurethane surface treatment) which facilitates ease of maintenance and eliminates the use of acrylic emulsions. Residual indentation should be less than 0.25mm & should conform to EN ISO 24343- 1(EN 433). The product should have antibacterial properties. The product should also fulfil dimensional stability (EN ISO 23999(EN 434) & effect of furniture (EN 424). It should also be suitable for under floor heating. The product should have excellent sound absorption of 24 dB and excellent shock absorbent behavior. The laid flooring shall confirm the fire rating Cfl-S1 class as per EN 13501-1.

5 Double Glazed Fixed Partition

Slim Line Modular Aluminium Fixed partitioning frame of 100-105 mm x 25-30 mm which can accommodate 2 panels of glass of 10 mm thickness separated by 40-50 mm distance for better sound insulation and acoustic properties. The rate to include Design, Fabrication, Supply, and Installation & Handover of slim line fixed partition system. The fixed partition system should accommodate open able door on Hinges. Door to be paid separately. The system of fixed partition with open able door to be custom designed to withstand the design confirming to IS -875 part III. The system shall have two barrier gasket system to hold glasses.

Microwave cured EPDM gaskets to accommodate glass thickness as per structural requirement, weather sealants, and SS 310 grade screws of approved make, all in complete required to perform as per specification and drawing in conjunction with BOQ.

The extruded aluminium sections of Alloy 6063 T5 / T6 & tolerances confirming to DIN / EN standard, of approved architectural sizes, from approved extruder. The structural profiles shall have minimum 1 to 1.6mm wall thickness. All the internal visible surfaces shall have high Durability) / Super durable (Jotun) Powder coating of 60 - 80 micron confirming to ASTM E 283, ASTM E 331, ASTM E 330AAMA 2604 or anodizing shade as approved by Engineer with minimum 25 micron The non-visible aluminium surfaces shall have minimum chromatizing treatment.

Material shall be as per make list in tender document...

All shade approval shall be as per Architect's/Engineer Approval.

The system shall demonstrate performance for air seal / water seal / structural requirement.

The system performance test shall be mandatory. The performance test shall be carried out at an accredited laboratory having fully atomized data acquisition system with provision to capture all values in the test results sheet. The sequence of test and standard shall be ASTM E 283, ASTM E 331, ASTM E 330, and AAMA 501.1.

The quoted rate shall include all design, engineering & shop drawing approval.

Glass: 2 NO.10 mm clear Heat strengthened/ TOUGHENED Glass or as specified in BOQ.

Tolerance of 5 mm allowed in both dimension of the cross section of the slim line partition as per manufacturer's specification.

6 SLIM LINE MODULAR SINGLE GLAZED PARTITION

Slim Line Modular Aluminium single glazed partition frame of 100-105 mm x 25-30 mm with in bottom and top channel with acoustic gasket as per specification.

The rate to include Design, Fabrication, Supply, Installation & Handover of Fixed partition frame. The fixed partition should accommodate 10mm heat strengthened glass. Sliding Door to be paid separately. The fixed partition to be custom designed to with stand the design confirming to IS -875 part III. The system shall have barrier gasket system to hold the glass.

Microwave cured EPDM gaskets to accommodate glass thickness as per structural requirement, weather sealants, and SS 310 grade screws of approved make, all in complete required to perform as per specification and drawing in conjunction with BOQ.

The extruded aluminium sections of Alloy 6063 T5 / T6 & tolerances confirming to DIN / EN standard, of approved architectural sizes, from approved extruder. The structural profiles shall have minimum 1 to 1.6mm wall thickness. All the internal visible surfaces shall have high Durability / Super durable (Jotun or approved equivalent) Powder coating of 60 - 80 micron confirming to AAMA 2604 or anodizing shade as approved by Engineer with minimum 25 micron The non-visible aluminium surfaces shall have minimum chromatizing treatment.

Material shall be as per make list in tender document.

All shade approval shall be as per Architect's/ Engineer Approval.

The system shall demonstrate performance for air seal / water seal / structural requirement. The system performance test shall be mandatory to verify performance test shall be carried out at an accredited laboratory having fully atomized data acquisition system with provision to capture all values in the test results sheet. The sequence of test and standard shall be ASTM E 283, ASTM E 331, ASTM E 330, and AAMA 501.1.

The quoted rate shall include all design, engineering as per drawing

/approval. Glass: 10 mm clear Heat strengthened/ Toughened or as

specified in BOQ.

Tolerance of 5 mm allowed in both dimension of the cross section of the slim line partition as per manufacturer's specification.

6.1 HINGED DOOR

Door shutter for Modular Slim line Aluminium partitioning frame should be of 44mm x 70mm using outer frame of 100-105 mm x 25-30 mm vertical 2 top frame and 50mm x 25mm as outer frame. Hingable door width 0.90mt - 1.10mt as per drawing. Glass beads at horizontal top and bottom should accommodate glass
11.52 mm thick acoustic glass of combination (5mm + two layers of 0.76 mm thick acoustic PVB + 5mm) HS glass for optimum sound insulation wherever required. Microwave cured EPDM gaskets to the glass as per requirement. Door to function on hinges.

Tolerance of 5 mm allowed in both dimension of the cross section of the slim line partition as per manufacturer's specification.

6.2 SLIDING DOOR AND PARTITION SYSTEM

Slim Line Modular Aluminium single glazed SLDING Door partition SYSTEM unit of total width size of slider door shall be 2.0 mt to 2.4mt as per site requirement with top outer frame of 46x76mm, shutter with top and bottom channel of 30mmx38mm and vertical channels of 18mmX38MM with acoustic gasket as per specification.

Slim Line Sliding door system sliding over the Fixed partition frame system unit Sliding Openable Door with acoustic glass should be on Sliding Mechanism which shall slide parallel to the single glass partition. The sliding mechanism shall be at the top and the Sliding Door should hang and slide on the top mechanism and should not require a guide or track on the floor. The Slim Line Sliding Door System Shall have smooth functioning and the system shall be so designed to carry the load of the acoustic glass in the Slim Line Sliding Door Partition System and the mechanical slider shall also be designed to take the load of the acoustic glass. fixed partition paid in another item. The system shall have barrier gasket system to hold the glass. Microwave cured EPDM gaskets to accommodate glass thickness as per structural requirement, weather sealants, SS 310 grade screws of approved make, all in complete required to perform as per specification and drawing in conjunction with BOQ. The system of Sliding door and fixed partition to be custom designed to withstand the design confirming to IS -875 part III.

The extruded aluminium sections of Alloy 6063 T5 / T6 & tolerances confirming to DIN / EN standard, of approved architectural sizes, from approved extruder. The structural profiles shall have minimum 1 to 1.6mm wall thickness. All the internal visible surfaces shall have high Durability / Super durable (Jotun or approved equivalent) Powder coating of 60 - 80 micron confirming to AAMA 2604 or anodizing shade as approved by Engineer with minimum 25 micron The non-visible aluminium surfaces shall have minimum achromatizing treatment.

Material shall be as per make list in tender document.

All shade approval shall be as per Architect's / Engineer Approval.

The system shall demonstrate performance for structural requirement. The system performance test shall be mandatory to verify the performance test shall be carried out at an accredited laboratory having fully automised data acquisition system with provision to capture all values in the test results sheet. The sequence of test and standard shall be ASTM E 283, ASTM E 331, ASTM E 330, and AAMA 501.1.

The quote rate shall include all design, engineering & shop drawing approval.

Specifications for Acoustic Glass: 11.52 mm thick acoustic glass of combination (5mm + two layers of 0.76 mm thick acoustic PVB + 5mm) HS glass for optimum sound insulation wherever required

Tolerance of 5 mm allowed in both dimension of the cross section of the slim line partition as per manufacturer's specification.

7. LACQUERED GLASS:

6 mm and 10mm: 6 mm and 10 mm shall be Extra Clear Glass used for lacquered glass should be of Saint Gobain/ Asahi/ Pilkington and should be toughened in horizontal tempering line.

Lacquered glass to be made industrially (via air brushing process); opaque (if viewed against a support wall), coated with WATER BASED lacquer colour of brand Colour Spray AQUA by Regalead – United Kingdom Or Equivalent Brand ;Which is bound by Nano particle pure acrylic); Gloss Level – 40 ; where VOC < 1% ; highly durable ; humidity resistant (conforms to BS EN 1036 1999); environmentally friendly (no lead, no arsenic, no copper, no formaldehyde; compressive strength (1000 MPa) & tensile strength (40 MPa),same as float glass as per the detailed drawings and as approved by Architect/Engineer. Colour to be checked and tested via INDEX Colour shade card used worldwide as a colour choosing parameter.

7.1 INSTALLATION:

Before fitting the glass as a wall covering/panelling requires checking the state of the walls to avoid any deterioration in the paint on the back of the glass • should be fixed on a plain, dry, and clean surface free of aggressive agents • the entire surface should be in a uniform colour or ply colour to ensure a uniform appearance after installation • Glass should not be fixed on the support directly; there should be some space between the and the support to ensure air circulation • Air circulation space should be gap of 1–2 mm between the edges of two glass panels • In case a frame is being used for fixing of the AIS Décor, ensure that the frame is dry and clean • Layout for installation should be prepared prior to installation of the glass • A neutral base Clear silicone (like Dow Corning or McCoy Soudol)/ Pentagon mounting tape, and ensure that the tape is pasted in a vertical direction Acid-based silicone should not be used to fix • In case glass is being fixed on plywood, ensure that the surface of the plywood is free from any chemical, lubricant, or moisture

- it is recommended that installation on perfectly levelled 12 mm-thick water- proof marine plywood / MDF

/ Mineral fibreboard which is mounted on RCC wall / any other structure • If double-sided adhesive tape is used, mounting tape, and ensure that the tape is pasted in a vertical direction. If the glass is to be fixed in partition then the glass should be fixed in microwave cure EPDM

gasket perfectly fitting in appropriate profile to ensure proper insulation.

In case to be fixed on a wooden frame with beading, ensure good air circulation by making slots or holes at the side of the frame • In case to be fixed on studs, ensure no metallic surface is in touch with the glass. Plastic spacers and sleeves can be used • In kitchens, do not allow the glass to come into direct contact with flames or strong heat source, e.g., ovens, cooker hobs, very hot utensils, or pans. If used near a heater, for example, the temperature of the wall must not exceed 65˚C • Vertical gap between two adjacent sheets should be a minimum of 1 mm • Ensure that moisture is not allowed to collect behind the glass, either by allowing sufficient drainage and ventilation, or by sealing the area with suitable material • If the fitting is done by using a frame or clip, we recommend the insertion of nonmetal spacer between the frame or clip and the glass • When fitting lighter colours using adhesive strips, it is important to ensure that light cannot penetrate through the sides of the glass as this could cause shadows from the adhesive strips to show up on the front • Always use Silicone / tape brands recommended by AIS and exactly follow the instructions given by the adhesive manufacturer (particularly regarding the quantities of adhesive to be used per square metre).

7.2 HANDLING AND CUTTING

Always use clean gloves when handling decorative glass products • Lift the sheets one by one • When handling sheets with suction cups, apply cups to the flat, untreated surface. If this is not possible, extra care should be taken to ensure that proper vacuum is achieved. Be sure to keep the cups clean and free of dust

• Regularly sweep the cutting tables with a stiff brush to control dust and to minimize any glass grit and particles which could scratch the glass • Individual sheets should be washed after cutting to reduce the chance of staining from cutting oil • Glass sheets are cut most easily by scoring the flat, untreated side. If not possible, increased cutting pressure may be required, and testing is recommended prior to cutting stock sheets • Never allow coolant or cerium oxide to dry on the glass, as it may become a permanent stain on a porous surface • Painted side of the lacquered glass should be placed on the table while cutting • Care must be taken to insert paper or cardboard spacers in order to avoid scratches.

8. ACRYLIC SOLID SURFACE SHEET PANELLING

Wall cladding panels with 6mm solid, non-porous and homogeneous seamless, stain resistant, repairable, durable, hygienic environment friendly surfacing material acrylic solid surface sheet of or approved make with a minimum thickness 06 mm in color, design, fixing in customize design arrangement as per direction of architect/Engineer. acrylic solid surface sheet to be fixed on wall on top of 12 mm marine ply. adhesive of the same color to provide inconspicuous joints. grooves to be given at every 1mtr to give expansion & contraction movement to material. Thermoformable Acrylic solid surfaces should be used wherever required and shaped using heat. Acrylic solid surfaces should be as per requirement in relevant colour and should be developed as per design. The material / product used should be selected as per requirement and wherever it requires thermoforming, laying, etching, carving and shaping capabilities then thermoformable material
/product should be used. The product should be selected according to its use. The final

finished product should be seam less, joint less and shall maintain lustre and when etched it should have a smooth finish. The rate is inclusive of all operation, material and required pattern. cost of base like framework and 12mm thick ply will be paid under respective item.

Durability performance & Design flexibility / Non-porous & Hygienic(Anti-bactrial)

Acrylic solid surfaces should be tough and repairable. Acrylic solid surfaces should be solid all the way through, minor cuts, scratches or nicks can be quickly sanded out, restoring the surface to its initial appearance. solid surfaces should be long lasting.

Acrylic solid surfaces should be easy to clean and maintain. Acrylic solid surfaces should be stain and resistant and shall be non-porous.

Acrylic solid surfaces to be non-porous it should not support the growth of microbial growth. Acrylic solid surfaces should be workable and as per requirement it should be carve able, sandblasted, polished and cut-out to create a one-of-a-kind look in a variety of shapes and finishes. Acrylic solid surfaces wherever required should also be thermoform able or shaped using heat. Acrylic solid surfaces should be as per requirement in relevant colour and should be developed as per design and the material / product used should be selected as per requirement and it may require thermoforming, laying, etching, carving and shaping capabilities. The material / product used should be selected as per requirement and wherever it requires thermoforming, laying, etching, carving and shaping capabilities then thermoformable material /product should be used. The product should be selected according to its use. The final finished product should be seam less, joint less and shall maintain lustre and when etched it should have a smooth finish.The product should be in the colour seleted by the Architect/EIC/Architect. The final finished product should be seam less, joint less and shall maintain lustre and when etched it should have a smooth finish. Acrylic solid surface shall have Antibacterial certificate and TUV (Austria) FR grade certified.

Product Specifications

Property	FUNCTION INDEX SIGN	UNIT	TEST METHOD
Density	1.5 - 1.8	kg/dm3	DIN 52 102
Mass	16	kg/m2	
Barcol Hardness	55-70		DIN 68 861
Tensile Strength	25-60	N/mm2	DIN EN ISO 527
Flextural	30-60	N/mm2	EN 310
Modulus elasticity	5000 - 9000	N/mm2	EN 310

Ball Drop	170 - 280	N/mm2	DIN ISO 2039
Impact Strength	1.5 - 6.5	kj/m2	Din EN ISO 179
Long/thermal Expansion	3.5 x 10	m/m'k	DIN 53 752
Water Absorption	<0.04	%(mass)	DIN 53 495/ASTMD 570
Light Fastness	Blue Scale 5-7,		DIN EN ISO 4892
	Grey Scale 4-5		
Fungi & Bacteria	No Infestation		ISO 846 A/C

Calotitic Value	Ca. 10	Mj/kg	DIN 51 900
Fire Behaviour	B2		DIN EN 13501-1
Chemical Resistant	1B		DIN 68 861-1
Specific Weight	1.55-1.74g/cm at 20 degree C		DIN ISO 1183
Young's modulus	10900 N/mm2		DIN 53457
Bending Strength (12 mm Panel)	60 + - 5 N/mm2		DIN 53452
Impact Strength (12 mm Panel)	6.5 kj/m2		DIN EN ISO 179
Impact Resistance (12 mm Panel)	No Break		ISO 19 712-2
Stability Of Glued Joint	60%-80% Of Material Stability		ISO 527
Barcol Hardness	65 + - 5		DIN EN 59
Scratch Resistance	0.6 N		DIN EN 438-2
Thermal Expansion (length)	5.05 x 10-5 K-1		ASTM D 696
Stability - Boiling Water	No Visible changes		DIN 53799

Stability - Dry Heat	No Visible changes	DIN 68861 T7
Cigarette Burn	No Visible changes	DIN 53799
Stain Resistance Requirement	Meets Requirements	ANSI Z 124.3 (5.2)
water Resistance requirements	Meets Requirements	ANSI Z 124.3 (6.0)

9. PARTICLE BOARD:

Pre -laminated medium density fibre board exterior grade (Grade-I) IS: 14587:1998 marked, to frame, backing or studding with screws etc. complete (Frames, backing or studding to be paid separately).

Pre-laminated with decorative lamination on both side exterior Grade - I MDF Board 12 mm thick conforming to IS: 14587

10. WOODEN FIRE RATED DOOR:

Wooden fire rated doors as per BS: 476 Part- 20 & 22 & IS 3614 part-2 for stability, integrity and thermal insulation. 03 Criteria Wooden door confirming to IS 277 with the following specification. Recommended fire door shall have doors tested at CBRI for maximum rating of 2hrs tested either with or without vision panel. Individual Test certificates should be available for glass used in vision lites confirming the required fire ratings. Any deviation in specification other than what is mentioned in the test certificates are not allowed. Proper label confirming the type of door and the hourly rating is mandatory. Approved manufacturer should be ISO Certified Company. Door leaf shall be minimum 52mm thick fully flush door with or without vision lite. 52mm thick shutter, comprising of 75mm x 44mm hardwood internal timber frame work, with infill of 48 kg/m3, ceramic fiber blankets, coated with FR intumuscent coating on both sides for insulation. The coated insulation shall be sandwiched between maximum 12mm thick Calcium Silicate Boards on both sides (edge to edge on internal Hardwood frame) having a maximum density of 900 Kgs/ Cum, cladded with 3mm ply commercial ply on both faces. (The same can be pasted with 1mm thick laminate (as per approved shade) or replaced with 4mm thick teak ply as per client's requirement at an extra cost) on both sides of the shutter, with 50mm x 10mm hard wood lipping all round the shutter. The door frame will be made out of Hardwood of maximum section 120 x 70mm and coated with Fire Retardant Primer. The rebate shall be of 20mm x 54mm in the Door Frame to accommodate the shutter. Fire seal of size 20x4mm on all the three sides of the except bottom.

The pasting of the ply/veneer/laminate should be done using automatic machine and should be free from any nails or perforations.

11.0 ECORESIN PANEL

Eco resin translucent panel 10mm thickness floral or stone finished of approved make complete as per specification. These panels will be fixed to wall with SS studs/BB frame and maintain gap off 200mm from the wall. LED lights at the back as required includes supply and fixing of backlit ecoresin panel which includes Ecoresin panel, LED lights and necessary hardware for fixing of Ecoresin Panel. The item does not includes the provisioning electrical point which is a part of the Electrical BOQ.

12.1 FULLY AUTOMATIC GLAZED SLIDING DOOR: -

12.1.1 General:-

Automatic sliding door operator Automatic sliding door Set 1 operator as per approved dwg.

Compliant with European standards. Product should be TÜV test certified for 1 Million cycles, tested according to the low voltage guidelines & operator unit power consumption not exceeding 100 W/Hr , fulfils DIN 18650 standards. The track profile should be flexible for both surface mounted & ceiling hung application with additional profile for vibration & sound dampening feature. It should includes micro processor controlled drive unit, with self learning mechanism, program selector with knob, motion detection sensor – 2 nos , 1 on each side , including passage safety combi-sensor on one side , mechanical components, toothed belt, cover profile not exceeding 110mm visible H, floor guide for frameless glass (02 nos), glass clamping rail (02 nos), Body finish : standard silver anodised operator profile electromechanical lock with 12 mm plain toughened frameless glass for complete elevation - 2 moving panels. UPS of 750 VA shall be provided by others, which will give power backup of 20 min. Only & if the duration of power cut to the operator is more than 30 min.,then separate arrangement needs to be done for the same as automatic operator requires uninterrupted stabilized power supply. it should include wall corner Protection. (WCP)

All complete as per direction of Architect/EIC/Architect.

12.1.2 Installation:-

The track profile should be separate from the main profile for enabling reduction in vibration insulation. Microprocessor control, self-learning, reverses when obstruction is encountered. Microprocessor-controlled control unit. It should be Self-learning, with adjustable parameters for opening and closing speed, hold-open time and opening and closing force. Class of protection IP 20. The electric operating Mechanism shall be mounted and concealed within the Stainless Steel header and the Controller Unit shall be Micro Processor Based.

12.1.3 Technical Parameters: -

Parameter	
Drive Unit	Top mounted actuator
Travel Control system	Encoder
Capacity	90 kg each leaf maximum
Power Supply	< 100 W
Duty Class	5-very heavy duty
Intermittent operation	S3=100%
Opening speed	150-600 mm/s (Adjustable)
Closing Speed	100-550 mm/s (Adjustable)

Opening Time	0-9 Seconds (Adjustable)
Accessories Power supply	24V=/0.5A
Manually adjustable functions	Drive force. Dwell time during opening 0-30 seconds. Partial opening.
Self-adjusting functions	Maximum opening closing limits Rotary programmer.
Safety devices	Combi Sensor(Microwave+ Infrared)/Built-in photocells
Control Switch	Pair of microwave radar for open & close operations
Std. Cable Length	5 Mtr - Motor to Radar & 5 Mtr - Motor to Sensor
Safety devices	Combi Sensors for passage safety/Built-in photocells
Test Certificate	1 million Cycle

Features:-

F) CE marked according to the European Machinery Directive 2006/42/CE and type tested according to standard European Norm 13241-1.
G) Extruded anodized aluminum profile sliding guide and casing, sliding on reinforce nylon wheels.
H) Electronic control board with microprocessor.
I) Built in electronic antic rush devise with encoder.
J) Manual and automatic settings with trimmer and dipswitch.
K) Automatic closing, reversal safety, obstacle detection, adjustment, automatic closer time.
L) Test certification for the number of cycle tested.

12.2 HARDWARE:

12.2.1 Digital Lock:-

Digital Lock without cut-out. Digital door lock to be stand-alone systems with an electronic control mechanism. The lock to be enable to be operated with all three modes with fingerprint + password + IC card from the list of specified make with necessary accessories. Should have a capacity of 10 administrators and more than 300 ordinary users. Should have minimum 2 cards. Cost of two cards included. Locks to operate either on alkaline batteries or rechargeable lithium-ion cell ones. In both cases, an alert or indicator should be there to indicate the level of battery level when batteries need to be replaced. Lock to have Speedy and accurate access with the optical finger print authentication. The fingerprint recognition to be robust against any dust or foreign materials.

12.2.2 Hydraulic Door Closer: -

Overhead cam action door closer with adjustable closing force EN2-4.

12.2.3 Floor Spring: -

Double action floor spring for door including cost of cutting floor required, embedding in floor and cover plates with pivot and single piece sheet cover box with side plates etc. as per direction of Architect/EIC/Architect.

Floor spring certified with std. spindle and cover plate. The floor spring with back check and adjustable closing speed. Non-hold open options As per EN 1154 and CE marked. Finish: satin stainless steel.

12.2.4 Pull Handle: -

SS Pull handle of 300 x 25mm size, CTC 212 mm with necessary fixing accessories, washers & screws etc. complete as per direction of Architect/EIC/Architect. A.150 Back to back with adjustable fixing for glass, wood and metal doors in satin stainless steel. The pull handles should have supporting washer with raised beveling on the outer surface. Length=171mm, 19mm dia, ctc 152mm- SS304. 300 back to back with

adjustable fixing for glass, wood and metal door in satin stainless steel. The pull handles should have. Supporting washer with raised beveling on the outer surface. Length=300MM, 25MM DIA-SS304 supporting washer with raised beveling on the outer surface. Length=300MM, 25MM DIA-SS304

12.2.5 Lever Handle with Lock: -

Tubular lever handle with sash lock with back set, Foreend, Euro profile cylinder with one side key and other side knob operation with strike plate and fitting with necessary screws etc. complete

External trim lever type finish: silver. Complete set including spindle, screws & all fixing accessories.

pin euro profile half cylinder with one side key operation standard length 42mm in satin nickel plated finish with 3 keys. Optional master keying and grand master keying can be done on request.

Lever handle package consist of tubular lever handle sash lock with 55mm back set, CTC-72mm and 20 mm for end, euro profile cylinder with one side key and other side knob operation with 20 SS strike plate.

13. ABOVE FALSE CEILING GYPSUM PARTITION - FORMED OF GI FRAME WORK

Partition from false ceiling level till true ceiling

level Framework - (2 layers of GI Ultra studs)

To be formed 2 layers of GI Ultra studs of size 48mm (0.5mm thk having one flange of 34mm and another flange of 36mm made of GI Steel), placed at 600mm centre to centre fixed on to the floor channels. The GI channels of size 50mm x 0.55mm (section thick) to be fixed on the floor to hold GI studs as per details. To have 5mm air gap between the 50mm frame work as per details. Infill -2 Layers of Fibre glass wool insulation
- 1000gms/m2. As an acoustic requirement, contractor to affix 50mm thick 2 layers of Fibre glass wool insulation of density 1000gms/m2, of approved make wrapped in GI chicken mesh on both sides as per manufacturer's specifications, Cladding - First layer on both sides - Fibre cement board Density 1400kg/M3. The framework to be cladded on both sides with single layer of 12 mm thick (High Pressure Steam Cured) Fibre Cement Wall Board confirming to IS 14862: 2000 Category Type B are screw fixed on either side of the framework with 25mm fully threaded self drilling self tapping countersunk fibre cement screws at 300mm c/c. The joints of board are to be staggered to avoid through joints. Finally, the beveled edges of the board are to be jointed and finished so as to achieve flush finish, which includes Interior Jointing Compound & Paper tape as per the recommended practices. To have 3mm thick sound deadening membrane (Density 1800Kg/M3) as per details. Cladding - Second layer on both sides - Gypsum board Densit
y 1000kg/M3. The Second layer to be cladded on both sides with single layer of Acoustic Rated Gypsum board which includes tapered edge 12.5mm thick Acoustic Rated Gyp board

(conforming to IS 2095-1982 & 2542- 1981) screw fixed with 35mm dry wall screw at 300mm c/c to Existing first skin of Partition. Care should be taken that the joint should be staggered to avoid sound leakage. Finally square and tapered edges of the boards are to be jointed and finished so as to have a flush look which includes filling and finishing with a jointing compound, joint paper tape and two coats of drywall top coat suitable for Gyp board (as per recommended practice of India Gypsum or equivalent). Rate shall be inclusive approved make Gypsum edge guard on edges of the partition and finished as per manufacturer's specifications. To have 3mm thick sound deadening membrane (Density 1800 Kg / M3) as per details.

14.0 MODULAR PANTRY

14.1 General: -

Kitchen Base Unit Box with BWP 18mm Water Proof Plywood's with Inside Quality 0.8mm laminate finish with Merino Lam or Green Lam Post form Sutter's Finish with Box Backside BWR 6mm Water Proof Plywood's with Box Backside applying 1Coat the Primer. With Quality Handles, Auto Hinges and all Doors Single Colors Finish.

Technical Specification and Materials Used in This Pantry

Finishing Materials : Laminated Kitchen

Structural Materials : 18mm Boiling Water Proof

Plywood Handle : G Profile Handle

Accessories : Plain Basket

Hardware : 0°Degree Hinges & 20" Channels, Glass

Profile Size of the Pantry : Approx. 2688mm / as per

site

14.2 Material use Detail: -

BWP Plywood / Block board Hardware

Trolly

Edge Bidding / Burma teak lipping

Frosted/Clear glass

15. PATCH DOOR

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 Architect/EIC/Architect.

Hydraulic Floor Spring

The hydraulic floor spring shall be heavy duty double action floor spring of make approved by the Architect/EIC/Architect suitable for door leaf of weight minimum 100 kg. The top cover plate shall be of stainless steel, flushing with floor finish level. The contractor shall cut the floor properly with stone cutting machine to exact size & shape. The spindle of suitable length to accommodate the floor finish shall be used.

Measurements

All the door sections including snap beadings fixed in place shall be measured in running meter along the outer periphery of composite section correct to a millimetre. The weight of cleat shall be added for payment. Neither any deduction nor anything extra shall be paid for skew cuts.

16. FALSE CEILING

16.1 Specification of Non DSR False Ceiling

16.1.1 Acoustic wooden ceiling in melamine finish with big circular perforations

Acoustical wooden ceiling in melamine finish with custom perforation 595x1195x16mm, Square edge (T15 Grid System)

Acoustic wooden ceiling in melamine finish with big circular perforations of 50mm dia, melamine laminated finish, 5-test fire retardant grade/ Non FR, size 595x1195x16mm, Square edge, volume density of base board 800Kg/m3, weight 8.8Kgs/m2 which is suspended by using 0.3mm thick metal grid system.

Metal grid system of 600x1200mm module includes wall angle with unequal flanges of 15/19mm, length 3000mm, fixed along the perimeter of walls with the help of nylon sleeves and suitable fasteners at 300mm centers. Then suspend the MainT with flange width 15mm, height 32mm and length 3600mm, from the soffit slab with help of soffit cleat and wire rod with leveling spring clip at 1200mm centres. CrossT with flange width 15mm, height 26mm and length 1200mm is interlocked into the pre-cut slots in the Main at 600mm centers in the perpendicular direction to the Main. Acoustical wooden ceiling in melamine finish 595x1195x12/16mm shall be placed into the grid size of 600x1200mm.

Technical Parameters

- Fire (Class) – 1 & P (For FR grade)
- Acoustics – NRC upto 0.85
- Thermal conductivity (W/mk)– na
- Climate (°C, RH) – 40, 70
- Light reflectance (%) – Colour Dependant

• Green (VOC, RC %) – Low, 25

16.1.2 Stretch NRC Fabric Ceiling

Stretch NRC system consisting of FR Grade NRC fabric with high-performance integrated core and acoustically-transparent face covering of choice colour, size 1.7mx75m, stretched by using combination of strut Cross Channel and Strut Tracks, woodfiber 10mm wooden base, polyfiber 10x10 infill with requisite accessories. The strut system includes strut Cross Channel, fully knurled, sectional thickness 0.55mm, length 3600mm, web 40, depth 10mm and equal flanges of 15mm is fastened to the wall @ 600mm centers. Wooden base 10mm is then installed on the strut along the marking lines with metal fasteners at 300mm centers. Strut tracks to be installed on wooden base, by first applying adhesive on both surfaces for a true and continuous secure grip, and heavy-duty fasteners at 150mm centers on one/both sides of strut tracks.

Inner Wood fiber square edge magnesite bonded pinewood fiber panels of size 600x1200x15mm having density 400kg/m3, weight 6kg which is fixed to Strut Cross Channel inbetween tracks. Long edge of panels should be perpendicular to length of Strut Cross Channel. Polyfiber 10x10mm pasted on woodfiber by using adhesive.

The stretch NRC acoustical fabric of width 1.7m is stretched and tucked into the strut tracks and secured to the locking jaws with purpose-specific tucking tools to obtain smooth, taut, wrinkle-free finish. Ensure the weft and weave of the fabric along with the surface are all oriented in one direction to achieve uniform shade.Note: Minimum 100mm additional fabric is required for tucking hence maximum module wall fabric width would be 1600mm. Frame work is not in this scope

Technical Parameters of fabric

• Fire (Class) – 1

• Acoustics – na

• Thermal conductivity (W/mk)– NA

• Climate (°C, RH) – 50, 90

• Light reflectance (%) – Colour Dependant

• Green (VoC, RC %) – Low, 25

Technical Parameters of

Woodfiber

• Fire (Class) – 1 & P

• Acoustics – NRC 0.97 (For 40mm C50 Mounting)

• Thermal conductivity (W/mk)– 0.07

• Climate (°C, RH) – 50, 95

• Light reflectance (%) – 80

• Green (VoC, RC %) – Low, 30

16.1.3 Acoustical Wooden Ceiling In Melamine Finish With Slotted Perforations

Acoustical wooden ceiling in melamine finish made of pinewood E1 grade fiberboard, with slotted perforations, melamine laminated finish, flame retardant grade, size 1200/600x600x16mm, tongue and groove edge, volume density of base board 800Kg/m3, weight 9.3Kgs/m2(6R16), 10.4Kgs/m2(6R32), 10.3Kgs/m2(G5R16) installed by using strut framework system.

Strut framework system includes Strut aluminium core cross channel having thickness 0.55mm, length 3600mm, knurled web 40mm, depth 10mm and equal flanges 15mm is fastened to wall or framework behind vertically/horizontally at every 600mm c/c. Strut aluminium core cross channel, thickness 0.5mm, length 2400mm, web 15mm & 27mm, depth 18mm and flanges of 7mm with suitable edge &centre brackets is then fixed perpendicular to the Strut with the help of fasteners at every 300mm centers. Acoustical wooden ceiling in melamine finish of size 600x600x16mm in then fixed perpendicular to strut with suitable edge & centre brackets. Contractor to provide expansion joints of 3mm at every 4.8m bothways.

Panels are backlined with polyfiber 10x25 held in position with dab spots of

adhesive. Technical Parameters

• Fire (Class) – 1 & P (For FR grade)

• Acoustics – NRC upto 0.85

• Thermal conductivity (W/mk)– na

• Climate (°C, RH) – 40, 70

• Light reflectance (%) – Colour Dependant

• Green (VOC, RC %) – Low, 25

16.1.4 LOOP Type 2 system

Supply & Installation of LOOP Type 2 system formed as an open metal ceiling with an open area of more than 50% and to the flare [5mm] of the perforation pattern [RV-50-40] the ceiling has a three-dimensional visual effect and hides the insight into the plenum. Bypassing the perforation, the S-shaped sides of the LOOP interlock both the long and front side joint with a non magnetic suspension, the elements are installed with a circumferential 1 mm joint, thus compensating tolerances in X and Y direction. The non-magnetic suspension system effectuates a self-alignment of the elements [puzzle effect]. The module size 966x1115x1.0mm steel is perforated with 60mm deep drawn holes .The substructure consists of a form perforated L

profile as a lateral grid which is suspended from the ceiling with nonius adjustable upper and lower parts or with threaded rods using official approved dowel plugs. The grid profiles are to be connected together at the ends by means of longitudinal connectors [screw fasteners]. The spacing of the grid profile is according to the requirements of DIN EN 13964. On profiles angles, C-band raster as secondary profiles are bolted on by means of C channel hanger bracket with threaded bolts. Only construction parts approved by the manufacturer may be used. Provide necessary supports, provisions as per the Architect/ Engineer Instructions. Tolerances according to TAIM, DIN EN 13964 and quality controlled to ISO 9001:2015 approved by SIS. Finish of ceiling is in RAL 9016 white/ RAL 9006 Silver grey powder coated with minimum 60 microns powder coating thickness. Visual perception of the ceiling to give seamless large perception and openless to area.

16.1.5 Braided Metal Open Compartment Ceiling

Braided metal open compartment ceiling. Braided metal open compartment ceiling is a decorative single blade open compartment ceiling system manufactured from 0.95mm thick perforated Aluminium blades pressed together, available in white, Black or other Non metallic RAL finish. The unique process in which the aluminium blades are punched creates a interwoven structure finish resulting in daylight reflecting off the exposed perforated edges producing a radiant effect which can be enhanced with illumination to create a reflected spacious modern ceiling. The ratio between cell dimension and cell height allows the technical elements of Braided metal open compartment ceiling to effectively disappear in the ceiling void which guarantees maximum transparency. The panel having cell size of 33.33 x 33.33 mm. The assembled Braided metal open compartment ceiling shall be in size of 600x1200 made out of single blades in 0.95mm (W) x 40mm (H) having perforation of QG 3.5 x 3.5mm and open area of appx 90 % . The ceiling panels are then clipped into secondary galvanized mild steel metal carriers, coated in black finished at 1200mm c.c. Wire clips shall hold the cell ceiling panels into the secondary galvanized mild steel metal carriers. Once the secondary galvanized mild steel metal carriers are installed then primary angles made out of galvanized mild steel metal, are cross connected to the secondary galvanized mild steel metal carriers at 1200mm c.c. for lateral bracing. The whole ceiling shall be suspended by threaded rods installed 1200mm c.c. The panels are fully downward demountable / hinged from the proprietary secondary galvanized mild steel metal carrier section using spring panels. The system should be in accordance with Material class A2-s1, d0 according to EN 13501-01 “non-combustible”, as per the Direction of Architect/Engineer. The system will meet fire retardant standards of BS 476: Part 6 & Part 7. Tolerances according to TAIM, DIN EN 13964 and quality controlled to ISO 9001:2015 approved by SIS, LEED certification by IGBC. Manufacturer shall have the fully automatic powder coating system with power and free conveyorize 3mtr/minute capacity. Powder coating plant shall be equipped with latest modern technology with fully automatic inline Pre-treatment using nano technology, Inline automatic water drying system after pretreatment.

16.1.6 Hanging Acrylic False Ceiling

Hanging false ceiling made of 12mm thick Acrylic solid surface. the ceiling could be in curve or could be in linear geometric shape as per the design requirement and the cost shall include all shapes and sizes. The acrylic solid surface could be of soild colour, pattern or could be translucent as per the requirement of design/ drawing. The curvatures in the acrylic solid

surface shall be made as flawless as possible to give even finish. The adhesive used for joining the acrylic solid surfaces shall be of the same manufacturer of the same colour so that the joints are not visible and shall be as seamless as possible in case they're not required to have grooves or end to end see-through slits.The frame shall be of Stainless Steel tube 40x40 mm minimum 3 mm thick with 3 mm thick 40x40 mm Stainless Steel Tube/flat minimum 3 mm thick over the MS tube frame as per requirement of stability and weight carrying capacity and its requirement for support. The support structure of Stainless Steel and MS shall be so sturdy so as to carry the weight of the Acrylic, lights and diffusers etc. as per site. The rate will not include the cost of framing. The Acrylic Surface has to be screwed over the Stainless Steel as per design requirement to ensure maximum stability and strength to structure and Acrylic surface shall touch only the Stainless Steel Structure. The edges of the Acrylic solid surface should be given a border of 50 to 100 mm in all edges. The entire Acrylic ceiling surface shall be joint less or shall have a grooves/slits as per design requirement. The joints at the edges should be joint less and seam less. The acrylic solid surface shall have cutouts for strip lights and other lights as per design. The hanging arrangement shall be done as per the requirement of lights required as per the design and reflections of light as instructions of Architect/Engineer. Perforations shall be made for lights. The joints are to be treated to give a seamless and joint less finish as per the manufacturer's specifications. Acrylic solid surface shall have Antibacterial certificate and TUV (Austria) FR grade certified.The shapes could be eliptical , circular, curved in any design as per site, drawing or Architect/Engineer directions.

Product Specifications

Property	FUNCTION INDEX SIGN	UNIT	TEST METHOD
Density	1.5 - 1.8	kg/dm3	DIN 52 102
Mass	16	kg/m2	
Barcol Hardness	55-70		DIN 68 861
Tensile Strength	25-60	N/mm2	DIN EN ISO 527
Flextural	30-60	N/mm2	EN 310
Modulus elasticity	5000 - 9000	N/mm2	EN 310
Ball Drop	170 - 280	N/mm2	DIN ISO 2039
Impact Strength	1.5 - 6.5	kj/m2	Din EN ISO 179
Long/thermal Expansion	3.5 x 10	m/m'k	DIN 53 752

Water Absorption	<0.04	%(mass)	DIN 53 495/ASTMD 570
Light Fastness	Blue Scale 5-7,		DIN EN ISO 4892
	Grey Scale 4-5		
Fungi & Bacteria	No Infestation		ISO 846 A/C
Calotitic Value	Ca. 10	Mj/kg	DIN 51 900
Fire Behaviour	B2		DIN EN 13501-1
Chemical Resistant	1B		DIN 68 861-1

16.1.7 Linear Hook-On Non Perforated Ceiling System With Graphic Digitally Print

Linear hook-on ceiling System. The non perforated panels are made to 2100(L)x300(W) or approved size manufactured out of minimum 0.6mm thick galvanized mild steel sheets and hooked onto the shorter side.Finish of the panels to be powder coated with graphic digitally printed UV cured woodgrain finish with minimum 60 microns base coating. All panels are hooked onto a secondary grid known as U1005 installed at shorter side of the panel to ensure individual demounting of panels for easy accessibility of services . A primary grid of perforated L- Angle in 30x30x1.2mm thick galvanized steel primary carriers in galvanized mild steel is installed perpendicularly to hook on profiles at maximum centers at 1200mm. The entire ceiling shall be suspended with threaded rod using Hilti fastener with minimum load of at least 0.5kn per anchor. The suspension system shall be as per manufacturer specification . The panels shall include the site cutting / making openings for services e.g. lights for information boards, smoke detectors, speakers, diffusers, grills etc. Measurement to be done on edge to edge basis without any deductions for AC grills or any other services integrated within the false ceilings. Tolerances according to TAIM, DIN EN 13964 and quality controlled to ISO 9001:2015 approved by SIS, LEED certification by IGBC. Manufacturer shall have the fully automatic powder coating system with power and free conveyorize 3mtr/minute capacity. Powder coating plant shall be equipped with latest modern technology with fully automatic inline Pre-treatment using nano technology, Inline automatic water Drying system after pretreatment.

16.1.8 NRC Clouds

Clouds NRC, square edge, FR grade NRC fabric (colour as per approved by the Architect/Engineer wrapped grassfire core panel of size 600x1200x25mm having volume density 120Kgs/m3 and weight 3kg/m2. Each cloud is provided with 4 sets of accessories containing spring hooks, levelling clip and hanger wires. Springs to be rotated and anchored at back of each panel at four points to hold the panel stable. Supplied hanger wires to be first dropped from the beam/slab/truss to desired height with suitable cleats/anchor bolts. Subtex Clouds NRC panels are then suspended using spring hooks and hanger wires and levelled into position with supplied levelling clips.

Technical Parameters

- Fire (Class) – 1 & P
- Acoustics – NRC 0.9
- Thermal conductivity (W/mk)– 0.07
- Climate (°C, RH) – 49, 90
- Light reflectance (%) – Colour dependent
- Green (VoC, RC %) – Low, 25

16.1.9 Organic Metal Ceiling

Providing and fixing organic metal ceiling composed of elegant circles and/or organic shapes. The organic metal ceiling is to counterpoint the strict lines of conventional ceilings with a flowing, harmonious room look. The ceiling should integrate the round lighting areas or round ceiling elements, which diameter determines the basic size of the different ceiling elements. Additionally, spot lights or LED lines shuld be integrated into the joints. The system should allow creation of individual ceiling configurations with only a few different parts. The dynamics of the ceiling can be influenced by the choice of the circles as well as by the possibility to choose the colour. The organic metal ceiling should have an option to be used as a closed ceiling or as a circular raft ceiling. The form elements made of sheet steel should be available in any RAL colours. Module size should be 1204mm×1204mm Joint width, 10mm Also available on request in the 600 or 900mm modules. Linear ceiling system Module size is to be 1204mm×1806mm and Joint width is 10 mm.The organic metal ceiling should be acoustically effective using perforated rectangular metal panels with acoustic fleece on the rear side.

The ceiling elements are to be fitted on the rear side with bolts and magnets and screwed on a rectangular ceiling system suspended in rail channels in the system. The organic metal ceiling elements at the butt of plates should be force-fitted. Security ropes prevent uncontrolled swinging down of the ceiling elements. The rail channels are to be tightened by means of screws to L-shaped primary carriers. The L-shaped primary carriers are to be used to enable lateral stiffening and should be suspended to the structural slab using patented suspension elements or threaded rods. The round area lightings are an integral part of the creative metal ceiling organic metal ceiling. The round shape should be in the diameter 600, 900, 1200mm and determines the basic size of the ceiling.

16.1.10 Custom Made Triangular Hook On metal Ceiling

Custom Made Triangular Hook On metal Ceiling system made out of 0.70 mm thick sheet. The ceiling panels are suspended form-fitting and tension-free by means of a special sub structure. Panels to be custom made perforated to 20x20x20mm Triangular CNC Punched Pattern @ 34.7mm Centres having sound absorption of approx. 0.70 with use of special acoustic tissue pasted at the back of panels. Panels to come in sizes 1000x1000x1000mm (Can vary as per requirement).Panels to be powder coating win selected Non Metallic RAL finish with Coating thickness of appx 70-80 µm. Demounting is performed without tools. Tolerances and quality requirements according to TAIM, DIN EN 13964. Delivery and installation of a System substructure consisting of form punched angles as a lateral grid which is suspended pressure-rigid from the bare ceiling with threaded rods using official approved dowel plugs. The angles are to be connected together at the ends by means of longitudinal connectors. The spacing of the grid angles is according to the requirements of DIN 18168 and DIN EN 13964 as well as the loads of the system and are to be determined and checked by the contractor. On the grid angles A-Z shaped carrier profiles 1.50mm Galvanized steel are attached as longitudinal profile with threaded bolts [secured against loosening].

The longitudinal connection of the Z-shaped carrier profiles are made by means of profile connectors. The spacing of the Z-shaped carries profiles is to be matched exactly to the spacing of the hook-in sides of the metal panels so that panels rest tension-free in the system. Care is

to be taken to ensure horizontal and flush alignment. It is only permissible to use structure components that have been approved by the manufacturer of the metal panels. All parts are made of galvanised steel. Substructure: Manufactureres specialy designed hook on substructure, Threaded rods/fasteners, other fixing accessories included. The maximum suspension allowed is upto 2.0 mtr. No additional framing, bridging, lateral supports is to be a part of the quoted price by the comtractor. The system should be in accordance with Material class A2-s1, d0 according to EN 13501- 01 “non-combustible”, as per the direction of architect/Engineer. The system will meet fire retardant standards of BS 476: Part 6 & Part 7. Tolerances according to TAIM, DIN EN 13964 and quality controlled to ISO 9001:2015 approved by SIS, LEED certification by IGBC. Manufacturer shall have the fully automatic powder coating system with power and free conveyorize 3mtr/minute capacity. Powder coating plant shall be equipped with latest modern technology with fully automatic inline Pre-treatment using nano technology, Inline automatic water drying system after pretreatment.

16.1.11 Hingeable Open Compartment System With Cell Size Of 50mm

50mm Hingeable open compartment ceiling with cell size of 50mm in X and Y direction made out of 0.4mm thick coil coated Aluminium. The assembled compartment ceiling panels shall be in size of 600x1200 made out of blades in 9mm (W) x 40mm (H). The assembled cell ceiling panels are then clipped into metal secondary carriers in gdalvanized mild steel , coated in black enamelled finished at 1200mm c.c. Wire clips shall hold the cell ceiling panels into the metal secondary carriers in galvanized mild steel carriers. Once the metal secondary carriers in galvanized mild steel carriers are installed then primary angles made out of galvanized mild steel , type primary angles are cross connected to the secondary carriers in galvanized mild steel carriers at 1200mm c.c. for lateral bracing The whole ceiling shall be suspended by threaded rods installed 1200mm c.c. All panel modules must be hingeable through wire clips. The panels are fully downward demountable / hinged from the manufacturers specially designed secondary carriers in galvanized mild steel section using spring panels.The system should be in accordance with Material class A2-s1, d0 according to EN 13501-01 “non-combustible”, as per the Direction of Architect/Engineer. The system will meet fire retardant standards of BS 476: Part 6 & Part 7. Tolerances according to TAIM, DIN EN 13964 and quality controlled to ISO 9001:2015 approved by SIS,LEED certification by IGBC.

16.1.12 Perforated ceiling tile

Perforated ceiling tile made out of 0.50 mm thick galvanized mild steel sheet with accoustic fleece. Tile composite system to be provided to improve sound absorption (in black or approved RAL colour). Perforation should be adequate to improve sound absorption. All panel modules must be fixed through wire clips or placed well suported. The panels are fully demountable from the manufacturers specially designed galvanized mild steel section. The perforation should be equal distance and both the surfaces shall be smooth.

16.1.13 Backlit Acrylic Ceiling

Backlit Ceiling in 12 mm acrylic solid surface sheet of approved make. Acrylic solid surface shall have Antibacterial certificate and TUV (Austria) FR grade certified, Ceiling Installation to be done in translucent glacier ice color, thickness (12 mm), design backlit provision as

approved by Architect/Engineer. The material should be CNC cut to achieve the desired design as per architect/Engineer. The CNC cut Acrylic solid surface sheet to be fixed on ceiling . Adhesive of the same color. The material used shall be very translucent and the light shall pass through the acrylic solid surface enhancing the design and the lights passing should be very visible. The rate to exclude the framing, the frame should be of stainless steel or wood as per requirement of stability and weight carrying capacity and its requirement for support. The hanging/fixing arrangement and boxing shall be done as per the requirement of light translucency and reflection of lights required as per the design and instructions of Architect/Engineer. The backlit ceiling shall have the light passing and shall have translucency.

Product Specifications

Property	FUNCTION INDEX SIGN	UNIT	TEST METHOD
Density	1.5 - 1.8	kg/dm3	DIN 52 102
Mass	16	kg/m2	
Barcol Hardness	55-70		DIN 68 861
Tensile Strength	25-60	N/mm2	DIN EN ISO 527
Flextural	30-60	N/mm2	EN 310
Modulus elasticity	5000 - 9000	N/mm2	EN 310
Ball Drop	170 - 280	N/mm2	DIN ISO 2039
Impact Strength	1.5 - 6.5	kj/m2	Din EN ISO 179
Long/thermal Expansion	3.5 x 10	m/m'k	DIN 53 752
Water Absorption	<0.04	%(mass)	DIN 53 495/ASTMD 570
Light Fastness	Blue Scale 5-7,		DIN EN ISO 4892
	Grey Scale 4-5		
Fungi & Bacteria	No Infestation		ISO 846 A/C
Calotitic Value	Ca. 10	Mj/kg	DIN 51 900
Fire Behaviour	B2		DIN EN 13501-1

Chemical Resistant	1B		DIN 68 861-1

Acrylic solid surface shall have Antibacterial certificate and TUV (Austria) FR grade certified. The cost of framing and boxing included.

16.2 Measurements:

Length and breadth shall be measured correct to cm. Installed Ceiling area shall be measured in square meter nearest to two places of decimal. Openings for light fixtures shall not be deducted while measuring area. The rate shall include the cost of materials and labour required for all the operations described above.

17. WALL PANELLING:

17.1 Perforated Zinc Titanium Cladding :

Titanium zinc Interlocking wall cladding panels in Pre Patina BLUEGREY/GRAPHITE GREY Finish. The wall cladding system shall comprise of the following described 0.8/1 mm interlocking panels of 250-300 mm width and max 1000 mm length. The interlocking panels are to be fixed using necessary accessories as proposed by suppliers standard methodology and connected end to end. Screws should be of SS Grade 410.Rivets powder coated in same finish ans the sheets and made of Aluminium. The substructure should be erected using Aluminium box sections of 25/30 x 50/60 dimensions. The Zinc sheets shall be as per EN 988 standards and must have TUV Certifications. The sheets should be purely natural without addition of any pigmentations.

Perforation : Custom CNC punching as per approved drawings . Circular perforation of varying diameters shall be done as per approved drawings to meet the façade intent .

17.2 Lacquered Glass

6 mm Extra Clear Glass used for lacquered glass should be of Saint Gobain/ ASAHI/ Pilkington and should be toughened in horizontal tempering line. Lacquered glass could be fixed with (Dow corning - 789) / Pentagon double sided tape @2-3 per Sqm) on a perfectly leveled 12mm thick water proof marine plywood
/ MDF / Mineral fiber board which is mounted on the RCC wall/any other structure Or installed using Stainless Steel Patch fitting Or Stainless Steel studs Or Aluminum frame. (Ply, MDF, MFB, SS Fitting, Aluminum Frame etc. to be paid separately) Lacquered glass to be made industrially (via air brushing process); opaque (if viewed against a support wall), coated with WATER BASED lacquer colour of brand Colour Spray AQUA by Regaled – United Kingdom Or Equivalent Brand ;Which is binded by Nano particle pure acrylic); Gloss Level – 40 ; where VOC < 1% ; highly durable ; humid resistant (conforms to BS EN 1036 1999); environmentally friendly (no lead, no arsenic, no copper, no formaldehyde; compressive strength (1000 MPa) & tensile strength (40 MPa),same as float glass as per the detailed drawings and as approved by Architect/Engineer. Colour to be checked and tested via INDEX Colour shade card used worldwide as a colour choosing parameter.

17.3 Green Wall

Green Wall will include planting media of organic fertilizer like crop residue, vermin compost, wood ash, poultry manure ,cow urine etc., lighter than the soil, with good moisture capacity and used to ensure that load on vertical wall is minimized in Kg/Sqft.

UV Stabilized polypropylene planters of nominal size 19.6 Inches(Length)X6.2 inches(Height)X9 inches (Wide) of each module or equivalent make, specially designed to keep the centre of gravity of growing plants with in the planters with suitable Geo-Textile separator to separate the planting media with water reservoir and keep the perforation holes unclogged. The installation of planter will be such that to make it theft proof.

Plants of minimum height 152mm(5 plants for each planter) such as Interim, Lal sag, Alternanthera Chlorophytum vareigated, Jade, Schafflera, etc. selected on the basis of temperature, incidence of sun light and humidity on site ;in pattern finalised in consultation with as per direction of Architect/Engineer.

Drip Irrigation - with BIS approved 50 mm CPVC pipes, inlet supply of water, outlet pipe for distribution of water with 25mm Dia pipe and grid of dripper with 15mm Dia pipe with dripper. Nozzles can unscrewed and cleaned in case of clogging. The installation shall be without pump set. The watering should be as per Gravitational

Force i/c fixing. The suitable pressure compensating device, valve, elbow, end cap and all other accessories required to complete the

17.3.1 Irrigation system.

Mild Steel pipe frame grouting in RCC of mix 1:2:4, @ 51cm center to center embedded with vertical MS square pipe size 2.5cmX2.5cm with MS rectangular Pipe of 5cmX 2.5cm of border frame with MS Flats 25mm(W)X 2.3mm thick weight not less than 2.5 kg per mtr. 15cm center to center horizontally and with MS flats to hang the planter, with or without connecting plate on supporting wall or standalone including cutting, hoisting, fixing in position, welding etc. & frame painted with 2 coats of Black ate-corrosive bitumastic paint in all complete as per site requirement.

Complete maintenance of vertical garden with supply of water for irrigation through pump set/water tanker including watering through drip irrigation, cleaning/replacement of dripper, replacement of dripper, change of pot pattern after 15 days interval or as per requirement of site complete. T&P shall be provided by the Contractor. The cost of casualty of plants 25% as natural casualty for the first three years and also refilling of cup inside covered by Geotextile cloth of 250 GSM in bottom and further fill up 1:2 ratio with coco peat and soil rite mixture all complete.

17.3.2 Pump set for Green Wall

Single phase submersible motor pump set - suitable HP, in underground tank with starter panel completer in all respect (KSB, Kirloskar, Techno, Texmo, Taro, Calama, Pluga, Crompton Greaves etc.) Note : motor pump shall be able to cover upto area of 1000 sqft comprising of 10

normal/standard panel of size 10ft x10ft
=100ft each.

17.4 Fabric Wrapped Sculped Pinewood Fiber Panel

Square edge, fabric wrapped pinewood fiber panel of size 600x1200x20mm sculped in as per drawing and design as per the instruction of the Architect/Engineer, density 400 kgs/m3, weight 8kg/m2 installed using Strut framework system with non-visible fasteners using Strut H-Spline.

The Strut framework systems includes strut 50mm Cross Channel having thickness 0.7mm, length 3600mm, knurled web 50, depth 50mm and equal flanges 15mm is fastened to wall positioned horizontally in a regular manner at 600mm c/c. Strut H-Spline having sectional thickness 2mm and length 2400mm to be fixed perpendicular to the Strut 50mm Cross Channel at 600mm centers. The kerfed edge fabric wrapped panels shall be then inserted into the Strut H-spline along their long edges of 2400mm against framework to perfect fit with staggered short edges.

Note: Thickness is given for bare Panels

The system is backlined with the acoustical infill of polyfiber

Technical Parameters

- Fire (Class) – 1 & P
- Acoustics – NRC 0.95 (For 25mm C50 Mounting)
- Thermal conductivity (W/mk)– 0.08
- Climate (°C, RH) – 50, 90
- Light reflectance (%) – colour dependant
- Green (VOC, RC %) – Low, 30

17.5 Acoustic panels with slotted perforations

Acoustic melamine panels made of pinewood E1 grade fiberboard, with slotted perforations, melamine laminated finish, flame retardant grade, size 1200/600x600x16mm, tongue and groove edge, volume density of base board 800Kg/m3, weight 9.3Kgs/m2(6R16), 10.4Kgs/m2 (6R32), 10.3Kgs/m2(G5R16) installed by using Strut framework system on walls .

Strut framework system includes Strut aluminium core cross channel having thickness 0.55mm, length 3600mm, knurled web 40mm, depth 10mm and equal flanges 15mm is fastened to wall or framework behind vertically/ horizontally at every 600mm c/c. strut aluminium core cross channel, thickness 0.5mm, length 2400mm, web 15mm & 27mm, depth 18mm and flanges of 7mm with suitable edge &centre brackets is then fixed perpendicular to the Strut with the help of fasteners at every 300mm centers. Acoustic melamine panels of size

600x600x16mm in then fixed perpendicular to with suitable edge & centre brackets. Contractor to provide expansion joints of 3mm at every 4.8m bothways.

Panels are backlined with polyfiber 10x25 held in position with

dab spots Technical Parameters

"• Fire (Class) – 1 & P (For FR grade)

• Acoustics – NRC upto 0.85

• Thermal conductivity (W/mk)– na

• Climate (°C, RH) – 40, 70

• Light reflectance (%) – Colour Dependant

• Green (VOC, RC %) – Low, 25

17.6 Fabric Wrapped Pinewood Fiber Panel Sculped

Square edge, fabric wrapped pinewood fiber panel sculped as per design requirement of size 600x2400x20,25,30,40,50mm, density 400 kgs/m3, weight 8,10,12,16,20kg/m2 installed by using Strut framework system with non-visible fasteners using H-Spline.

The Strut framework systems includes Strut Cross Channel having thickness 0.7mm, length 3600mm, knurled web 50, depth 50mm and equal flanges 15mm is fastened to wall positioned horizontally in a regular manner at 600mm c/c. Strut H-Spline having sectional thickness 2mm and length 2400mm to be fixed perpendicular to the Strut CC50 Cross Channel at 600mm centers. The Kerfed edge fabric wrapped panels shall be then inserted into the Strut H-spline along their long edges of 2400mm against framework to perfect fit with staggered short edges.

Technical Parameters

• Fire (Class) – 1 & P

• Acoustics – NRC 0.95 (For 25mm C50 Mounting)

• Thermal conductivity (W/mk)– 0.08

• Climate (°C, RH) – 50, 90

• Light reflectance (%) – colour dependant

• Green (VOC, RC %) – Low, 30

17.7 Acoustical Wooden Perforated Board With Big Circular Perforations

Acoustical melamine finish wooden perforated board made of pinewood E1 grade fiberboard, with big circular perforations of 50mm dia, melamine laminated finish, Flame retardant grade,

size 600x1200x16mm, Square edge, volume density of base board 800Kg/m3, weight 8.8Kgs/m2 installed by using Strut framework system and Z bar.

Strut framework system includes Strut having thickness 0.55mm, length 3600mm, knurled web 35, depth 20mm and equal flanges 15mm is fastened to wall positioned vertically in a regular manner at 600mm c/c. Z-bar having 40mm height, thickness 1mm is first fixed behind the panels by using suitable fasteners. Another length of Z-bar are then installed over Strut horizontally at spacing so as to match with Z-bar at rear of acoustical melamine finish wooden perforation panels. Acoustical melamine finish wooden perforation panels of size 600x1200x16mm are then slided into the Z-bar fixed on Strut. Long edges of panels should be perpendicular to Z-bar and Short edges of the panel are staggered.

Panels are backlined with polyfiber 10x25 held in position with dab spots of approved adhesive Technical Parameters

- Fire (Class) – 1 & P (For FR grade)
- Acoustics – NRC upto 0.85
- Thermal conductivity (W/mk)– na
- Climate (°C, RH) – 40, 70
- Light reflectance (%) – Colour Dependant
- Green (VOC, RC %) – Low, 25

17.8 Acoustical Wooden Wall Panelling With Groove Perforated Slats

Acoustical wooden wall penalling made of pinewood E1 grade fiberboard, melamine laminated finish, groove perforated slats L8-2 - (2mm grooves @ 8mm centers) / L16-2 - (2mm Slats @16mm pitch) / L32-2
- (2mm grooves @ 32mm centers) / L64-2 - (2mm grooves @ 64mm centers) / L128-2 - (2mm grooves @128mm centers), backlined with acoustical fleece, tongue-groove edge for a seamless look, Flame retardant Grade, size 128x2440x16mm, volume density of base board 800Kg/m3, weight 8Kgs/m2 (L16), 10.5Kgs/m2 (L32), 11Kgs/m2 (L64) installed by using Strut framework system.

Strut framework system includes Strut aluminium core cross channel having thickness 0.55mm, length 3600mm, knurled web 40mm, depth 10mm and equal flanges 15mm is fastened to wall or framework behind vertically/horizontally at every 600mm c/c. Strut CC18 aluminium core cross channel, thickness 0.5mm, length 2400mm, web 15mm & 27mm, depth 18mm and flanges of 7mm with suitable edge &centre brackets is then fixed perpendicular to the Strut Cross channel with the help of fasteners at every 400mm centers. Slats of size 128x 2440x16mm in then fixed perpendicular to struts with suitable edge & centre brackets. Short edges of the panel are staggered. Contractor to provide expansion joints of 3mm at every 4.88m length wise and 4.992m width wise.

Panels are backlined with polyfiber 10x25 held in position with dab spots of approved adhesive Technical Parameters

- Fire (Class) – 1 & P (For FR grade)
- Acoustics – NRC 0.77 (For E300* Mounting)
- Thermal conductivity (W/mk)– na
- Climate (°C, RH) – 50, 70
- Light reflectance (%) – 75 (Maple Arce)
- Green (VOC, RC %) – Low, 25

17.9 Screwable Magnesium Board

Magnesium board of thickness 12mm having density 1000kgs/m3, weight 12kg/m2 fixed on the either side of metal framework.

Technical Parameters of magnesium board:

- Core - Magnesia
- Fire – upto 150 minutes
- Acoustics – STC upto 44-50
- Climate (OC RH) – 50, 99
- Termite resistance – Yes
- Moisture Absorption - 6.8% after 2hrs and 11.3% after 24hrs soaking
- Metal framework not included
- Wet Expansion - < 0.02% from ambient to saturation
- Dry Contraction - ≤ 0.02% from evaporation
- Moisture Movement - 0.02%
- Light reflectance – 80 %
- Green (RC %) – 30
- Hygiene (VoC, Clean room) – Low, Class 1
- Strength – Antisag
- Impact - 4kg hammer 175mm

17.10 Wall Paneling with 3D engraving

Wall Paneling with 3D engraving in 18mm thick acrylic solid surface sheet of approved make or as approved by architect basic white color. Design & fixing arrangement as per direction of Architect/Engineer. The material should be CNC 3D cut to achieve the desired design. The CNC cut Acrylic solid surface sheet to be fixed in a box frame or on a frame or on a flat surface as per the drawing and design and as per the instructions of the architect/Engineer. The material used shall be very translucent and the light shall pass through the acrylic solid surface enhancing the design and the lights passing should be very visible. The cost shall include the

framing and Boxing of wood / plywood and the frame should be of stainless steel or wood as per requirement of stability and weight carrying capacity and its requirement for support. The 3D shall be done as per the requirement of light translucency and reflection of lights required as per the design and instructions of Architect/Engineer. The backlit ceiling shall have the light passing and shall have translucency. Acrylic solid surface shall have Antibacterial certificate and TUV (Austria) FR grade certified.

17.11 Paneling with acrylic solid surface.

Wall cladding panels with 6mm acrylic solid surface, non-porous and homogeneous seamless, stain resistant, repairable, durable, hygienic environment friendly surfacing material acrylic solid surface sheet of or approved make with a minimum thickness 06 mm in color, design, fixing in customize design arrangement as per direction of Architect/Engineer. Acrylic solid surface sheet to be fixed on wall on top of 12 mm marine ply. Adhesive of the same color to provide inconspicuous joints. Grooves to be given at every 1mtr to give expansion & contraction movement to material. The rate is inclusive of all operation, material and required pattern. Cost of base like framework and 12mm thick ply will be paid under respective item. Acrylic solid surface shall have Antibacterial certificate and TUV (Austria) FR grade certified.

18. HEAT REFLECTIVE COOL PAINT

Finishing Terrace with a premium specially formulated roof and exterior coating which reflects the damaging UV rays and reduces the internal temp of the buildings. Reflects damaging ultra violet rays from the structures.

- Reduces internal energy demand.
- Dirt pick-up resistant technology.
- Excellent elongation and adhesion.
- Carbonation resistant.
- Breathable and waterproof.

18.1 SURFACE PREPARATION

Thoroughly abrade the surface to remove loose particles, dust and lattaince incrustations and existing paint using coarse wire brushes and water jetting.

Fill up all the cracks and crevices with Putty. No. of Coats: - 1 Primer + 2 top coats

19. ROLLER BLINDS

19.1 The item shall include supplying & fixing roller blinds of following specifications:

The drive unit shall be made of moulded plastic with steel spring support & inserted into the tube and it shall be driven by a ball chain pulley with ball chain and can be positioned at right side or left side of the shade. The shade when lowering or raising, shall be automatically locked in position upon release of the ball chain by means of a built-in friction lock. The end plug shall be moulded of plastic with a steel location pin. The plug shall be inserted into the tube end.(opposite to the drive unit).

The support brackets shall be of coated steel & provided with covers & used in right hand positions differentiated by the acceptance of the rectangular drive unit support or the round idler plug pin. The roller tube shall be of extruded aluminum with 38mm internal diameter & skin thickness of 1mm & shall incorporate a keyway integral with the tube to accommodate the spline. The outside diameter of the roller tube shall be 40mm.The bottom rail shall be a stiffening inserted into bottom rod pocket.

The bottom rail shall be a stiffening inserted into bottom rod pocket. The material may be timber, PVC covered steel tube or VB bottom rail. The ball chain shall be 2mm diameter cord with 4.5mm diameter acetal balls moulded co-axially to it on 6mm pitch to form an endless ball chain which is used for raising or lowering action of the shades.

Fabric shall be attached to the tube with an adhesive strip. A minimum of one turn of fabric must be placed on the roller before the working section of fabric starts.

The fabric shall be as per selection from specified Manufacturer's range & shall be sized according to site requirements, manufactured by Approved make as described below:

Blackout roller blinds with 100% polyester blackout fabric with reverse & front side pigment colour coated complete with installation.

Roller blinds with fabric made of 35% fiberglass, 65% vinyl on fiberglass and has to have Gold Green guard Certification.

19.2 Measurements:

Length and breadth shall be measured correct to cm. fully opened Roller Blind area from Drive unit to Bottom rail shall be measured in square meter nearest to two places of decimal. The rate shall include the cost of materials and labour required for all the operations described above.

20. GLASS FILM

20.1 Frosted Film:

Crystal Glass film FROSTED effect with approved artwork, cut using digital plotter. Self-adhesive, bubble- free installation to be done on clean glass , by Authorised Installers only.3M or equivalent Architectural Markets

20.2 Digitally Printed Film

Digitally reproduced Film could be fixed on Lift lobbys & Corridor partitions of 3M or equivalent Clear Graphics 114 make or approve equivalent. The film shall be Durable inkjet printed graphics on self adhesive vinyl, special CLEAR film to produce coloured imagery on glass. Customized imagery with approved graphics including providing company warranty at all leads & lifts etc.

21. TOUGHENED CERAMIC DIGITALLY PRINTED GLASS

12mm thick toughened ceramic digitally printed glass. 12 mm annealed Glass used for digital printing should be of Saint Gobain/ Asahi/ Pilkington and should be toughened in vertical tempering line. Digitally printed glass must be and only be of ceramic ink and printed on DIPTECH/TECGLAS Plant; ink should be of ceramic and carrier should be terepthalene oil, Which is then tempered post printing so that the ceramic ink embeds inside the glass making it permanent and homogeneous;; highly durable ; water resistance , UV resistance; environmentally friendly (no lead, no arsenic, no copper, no formaldehyde; compressive strength (1000 MPa) & tensile strenght (40 MPa),same as float glass as per the detailed drawings and as approved by Architect/EIC/Architect.

22. STAINLESS STEEL RAILING WORKS

22.1 Dia 50mm Round Baluster System:-

Supply and installation of Arch make 304 Grade Stainless Steel Knock Down railing system comprising Ø 50mm Handrail fixed on Ø 50mm S.S. Round baluster (Design Code ABT222-1-163) placed at maximum 1200mm c/c along with 3 Nos. Ø 16 mm mid rails connected at the side of baluster with fixtures. The balustrade would be fixed onto floor with casted base plate of minimum 6mm thickness. Base plate shall be concealed with suitable S.S. 304 grade cover Cap so that the mounting anchor fasteners are not visible after installation. Wall thickness of Handrail & Baluster Pipes shall be taken as 1.5mm & Mid Rail Shall be 1.2 mm along with all visible components developed in High Grade S.S. and whenever required, joints to be filled with bushings for extra strength. Railing height to be taken @ 1000mm from floor level.

22.2 Wall Mounted Railing systems:-

Supply and installation of Arch make 304 Grade Stainless Steel Knock Down Wall mounted Railing system comprising Ø 50mm Handrail mounted on the wall through Wall Brackets & anchor fasteners which will be placed at maximum 1200mm c/c distance and as per site requirement. Wall thickness of all Pipes shall be taken as 1.5mm along with all visible components developed in High Grade S.S. and whenever required, joints to be filled with bushings for extra strength.

22.3 Installation:-

Installation shall be by done a qualified, authorized representative of the manufacturer. Installation must be in accordance with standard or non-standard, yet applicable details (instructions) included on installation/shop drawings provided by the manufacturer. Install components plumb and in-line, accurately fitted, free from distortion or defects and securely anchored to structure.

22.4 Protection after installation:-

Contractor is to provide protective covering on handrails and guardrails if construction is not yet finished in the area where the railings are installed.

22.5 Measurements:-

Length of the finished Railing shall be measured correct to a cm. The rate shall include the cost of the labour, T&P and materials involved in all the operations described above.

23. Acrylic Solid surface LATTICE JALLI

Lattice Jalli partitions in 12mm thick acrylic solid surface sheet of approved make. The acrylic solid surface should be conforming to TUV (Austria)standards. Installation to be done in basic series with spickles, thickness (12 mm), as approved by Architect/EIC/Architect. The material should be CNC cut to achieve the desired design as per Architect/Engineer. The 6mm deep CNC cut Acrylic solid surface/ cnc cut lattice jail sheets to be fixed with the help of 25x25 mm Aluminum/25x25mm teak wood/75x75mm class teak wooden frame from all the 4 sides of the lattice jalli. Lattice jaali frame to be supported with the help of Hilti/ or approved fasteners as per requirement. Adhesive of the same color. The rate is inclusive of framework, material and required pattern approved.

Durability performance & Design flexibility / Non-porous & Hygienic(Anti-bactrial)

Acrylic solid surfaces should be tough and repairable. Acrylic solid surfaces should be solid all the way through, minor cuts, scratches or nicks can be quickly sanded out, restoring the surface to its initial appearance. Acrylic solid surfaces should be long lasting.

Acrylic solid surfaces should be easy to clean and maintain. Acrylic solid surfaces should be stain and resistant and shall be non-porous.

Acrylic solid surfaces to be non-porous it should not support the growth of microbial growth. Acrylic solid surfaces should be workable and as per requirement it should carve able, sandblasted, polished and cut-out to create a one-of-a-kind look in a variety of shapes and finishes. Acrylic solid surfaces wherever required should also be thermoform able or shaped using heat. Acrylic solid surfaces should be as per requirement in relevant colour and should be developed as per design. The material / product used should be selected as per requirement and wherever it requires thermoforming, laying, etching, carving and shaping capabilities then thermoformable material /product should be used. The product should be selected according to its use. The final finished product should be seam less, joint less and shall maintain lustre and when etched it should have a smooth finish.Acrylic solid surface shall have Antibacterial certificate and TUV (Austria) FR grade certified.,

Product Specifications

Property	FUNCTION INDEX SIGN	UNIT	TEST METHOD
Density	1.5 - 1.8	kg/dm3	DIN 52 102
Mass	16	kg/m2	
Barcol Hardness	55-70		DIN 68 861

Tensile Strength	25-60	N/mm2	DIN EN ISO 527
Flextural	30-60	N/mm2	EN 310
Modulus elasticity	5000 - 9000	N/mm2	EN 310
Ball Drop	170 - 280	N/mm2	DIN ISO 2039
Impact Strength	1.5 - 6.5	kj/m2	Din EN ISO 179
Long/thermal Expansion	3.5 x 10	m/m'k	DIN 53 752
Water Absorption	<0.04	%(mass)	DIN 53 495/ASTMD 570
Light Fastness	Blue Scale 5-7,		DIN EN ISO 4892
	Grey Scale 4-5		
Fungi & Bacteria	No Infestation		ISO 846 A/C
Calotitic Value	Ca. 10	Mj/kg	DIN 51 900
Fire Behaviour	B2		DIN EN 13501-1
Chemical Resistant	1B		DIN 68 861-1

24. 3D COPPER MURAL:

3D copper mural to be in panels in various sizes varies from 1.2 to 4.5 sqmtr. Hammered copper shall be fixed on 12mm BWP ply. Cot of ply to be included. Concept of copper mural will be specially be designed keeping in mind that the art mural will enhance the ambience and would improve its look aestheticallyFraming Cost includes frame of 25 mm X 50 mm Aluminum Box/ teak wood section installed on the plastered wall with suitable brackets /fasteners.

25. GI TRAP DOORS

GI Trap Doors are to be made to big sizes – upto 8′ long. For instance, even 8′ x 4‘. Big frames & shutter are reinforced with stiffeners to prevent warping

Only a uniform 2.5mm groove all around to be provided with sliding hinges, making it blend seamlessly with the ceiling

Trap Door to consist of an Inner Frame and an Outer Frame. Both the frames are to be completely flexible for any size requirement. Material for the frame is Galvanised Iron and the finish can be anodized or powder coated as per the recommendation of Architect/EIC/Architect.

26. 3D ENGRAVED ACRYLIC PANEL:

Designer Wall Paneling with 3D engraving in 18mm thick in solid surface sheet of approved make manufactured as per TUV (AUSTRIA). The colour shall be as as approved by Architect/EIC/Architect basic white color. Design &, fixing arrangement as per direction of Architect/EIC/Architect. The material should be CNC 3D cut to achieve the desired design. The CNC cut Acrylic solid surface sheet to be fixed in a cove developed as per design and the cost of cove wood or stainless steel shall be paid separately in separate items. The 3D acrylic shall be carved in the desin and theme suiting the environment. The maerial used shall bevery trancelucent and the light shall pass through the acrylic solid surface enhancing the design. The material used shall have translucency to enhance 3D effect.

Durability performance & Design flexibility / Non-porous & Hygienic (Anti-bactrial)

Acrylic solid surfaces should be tough and repairable. Acrylic solid surfaces should be solid all the way through, minor cuts, scratches or nicks can be quickly sanded out, restoring the surface to its initial appearance. Acrylic solid surfaces should be long lasting.Acrylic solid surface shall have Antibacterial certificate and TUV (Austria) FR grade certified.,

Acrylic solid surfaces should be easy to clean and maintain. Acrylic solid surfaces should be stain and resistant and shall be non-porous.

Acrylic solid surfaces to be non-porous it should not support the growth of microbial growth. Acrylic solid surfaces should be workable and as per requirement it should carve able, sandblasted, polished and cut-out to create a one-of-a-kind look in a variety of shapes and finishes. Acrylic solid surfaces wherever required should also be thermoform able or shaped using heat. Acrylic solid surfaces should be as per requirement in relevant colour and should be developed as per design and the material / product used should be selected as per requirement and it may require thermoforming, laying, etching, carving and shaping capabilities. The product should be selected according to its use. The final finished product should be seam less, joint less and shall maintain lustre and when etched it should have a smooth finish. The backlic ceiling shall have the light passing and shall have translucency.

Product Specifications

Property	**FUNCTION INDEX SIGN**	**UNIT**	**TEST METHOD**
Density	1.5 - 1.8	kg/dm3	DIN 52 102
Mass	16	kg/m2	
Barcol Hardness	55-70		DIN 68 861
Tensile Strength	25-60	N/mm2	DIN EN ISO 527
Flextural	30-60	N/mm2	EN 310
Modulus elasticity	5000 - 9000	N/mm2	EN 310
Ball Drop	170 - 280	N/mm2	DIN ISO 2039
Impact Strength	1.5 - 6.5	kj/m2	Din EN ISO 179
Long/thermal Expansion	3.5 x 10	m/m'k	DIN 53 752
Water Absorption	<0.04	%(mass)	DIN 53 495/ASTMD 570
Light Fastness	Blue Scale 5-7,		DIN EN ISO 4892
	Grey Scale 4-5		
Fungi & Bacteria	No Infestation		ISO 846 A/C
Calotitic Value	Ca. 10	Mj/kg	DIN 51 900
Fire Behaviour	B2		DIN EN 13501-1
Chemical Resistant	1B		DIN 68 861-1

27. STAIN GLASS MURAL:

Stain glass mural sandwich panel in 5mm stain toughened glass panel+5 mm thick toughened clear glass facing outside. Concept of stain glass will be specially be designed keeping the company's profile in mind the art mural will enhance the ambience and would improve its look aesthetically.

The material used in making the stain glass will be lead, 5 stain toughened glass panel+5 mm thick clear toughened glass, Imported resins and staining chemicals, imported color dyes overall thickness of glass in 10mm,thw two panes will be sealed with silicon as/approved from all sides.

Cost includes frame of aluminum powder coating which runs around the glass panel fixed to wall/RCC column.

28. ARTIFICIAL TURF:

Artificial Turf 40 mm thickness –Drain cells & application of Solvent below the Drain Cells. Drain cells functions as a highly efficient lightweight drainage system that rapidly captures and transports even high water volumes associated with torrential rain.

Terms that goes under artificial turf other than Drain Cells:
Large Stones. Rocks ranging from three-eighths to three-fourths of an inch are perfect for artificial grass sub- base.
Fine Materials. It is imperative to have a filler material, called fines, to surround the larger crushed rocks for overall turf stability.
Ideal
Mixture.
Weed
Fabric.

29. PLANTERS:

Planters for display of plants at Reception and diff area of Building indoor/Outdoor, highly resistant to breakage, harsh weathers and ultra violet rays. These Plants include air purifying plants, that would absorb all the toxins from the air released from the computers thus benefitting the long term health of the employees spending 8-10 hrs Indoors.

Areca palm (3'-4' ht., bushy) & planter size -13"X13"X18" with

fillers Spathypyullum wallici (1'-2' ht. bushy) & FRP planter size

-7.5"X7" with fillers Bosten fern (1'-2' ht. bushy) with & FRP

planter size -7.5"X7" with fillers

Drasaena marginata (2' ht. multibranch) & FRP planter size -

10"X10"X10" with Fillers Ficus lyrata (4' ht. branched) & planter size -

13"X18" with Fillers

Snake Plant (2.5' Ht.) & planter size -10"X 10"X10"

with Fillers Alocasia with 6'' pvc (white) pot of 1' ht

Raphis Palm 3-4' ht. multi tiller (4-5

tiller) Chamadora of 5-6' ht. bushy of

5-6' ht. bushy

Japanese bamboo/ Black bamboo of 4'-5' ht. multi

tiller (7-8 tiller) Ficus elastica of 2' ht. bushy

30. Wall art

Providing & Placing of Carved Wooden Mural in melamine finish panels of sizes 690mm (W) x 30-40mm
(D) x 1000mm (H). The fixing details shall be as per approved design and the surface

shall be fixed with suitable fasteners drilled etc. to ensure stability of the wooden mural. The carved wooden mural shall enhance the aesthetic beauty of the vertical/ horizontal surface as per site. Transportation to site included. Installation and fixing the mural is included. Scaffolding and support system to all height included. The design sould be approved by the Architect/Engineer.

31. Paintings

Providing & Placing of paintings in various sizes varies from 2 to 4.5 sqmtr. The canvas should be artistic matte cotton canvas 410 GSM. Matte finished, crack-resistant, water-resistant, top-coated and stretched over stretcher bars(wooden frame) at the back. The strecher bars is not visible from the front and sides. It comes with hooks and ready for hanging on the wall. The paintings should be mounted on wooden frames with melamine finish. The subject and design of the painting should complement the surroundings and add a meaningful presence and should be will be as per the decision of the Architect/Engineer.

32. Steel Glass Covering/ partition

Stainless Steel Glass Covering/ partition using spider fittings:- Fabrication, Supply & Installation of horiontal and vertical directional Covering/ partition using spider fittings (Conforming to SS304 Grade, Satin Finish) with various size of Covering/ partition using spider fittings. Structure consisting of SS304-219, 168 Tubular Sections with 75 x 75 Sections, fixing Plate (if required as per architectural plans), with4- Arm Stainless Steel Spider Glass fitting Arrangements with 8+1.52+8mm Thick Laminated Toughened Glass fixed with clear weather Silicon as per drawing and details. direction as per Engineer In Charge.

33. ACOUSTIC SLIDING FOLDING PARTITION

The partitions shall comprise of flat panels, plus 1 expanding panel (telescopic element) for closure. The sound coefficient (Rw) shall be 50dB. The sound insulation tests of the movable walls are carried out under German DIN standard with results measured in Rw. This is a standard test in a laboratory with so called flanking sound transmission. This test is the most realistic because it is a measurement under site conditions including sound transmission through ceiling, doors, walls etc.

The panels shall stack at the end of the track in center stacking formation. The thickness of each panel is 85mm including 16mm thick MDF on both sides.

The partition runs on a specially designed and firmly held track of heavy-duty aluminum in which a specially designed trolley on ball bearing runs smoothly and noiselessly. The closure of the spaces above, below and between the panels is done by a specially designed mechanism, which closes these gaps to prevent passage of sound.

33.1 Installation:

The track received from the manufacturer is affixed to this structure with suitable suspension arrangement after leveling and straightening.

Also the longevity and ease of operation depends on the precision and level of track achieved before the partition is installed. Therefore the installation process is as important as the quality of the partition.

These panels are thereafter suspended in the track and checked for smooth operation, parallel horizontal movement and sealing all around.

Providing & Fixing Centre Pole Outdoor Café Umbrella with Diameter is 3.5m which should provide great coverage to table. Fabric should be 100% Waterproof and weatherproof. Rod should be made up of MS, and the rotator liver should be made up of PVC. 20L Water Base shall be included with this umbrella,which could be either filled with water or sand for sturdiness.

Technical Specification of furniture Sub-head to be derived from the Nomanclature of the BOQ ITEM

34. MODULAR WORKSTATIONS (TILE BASED SYSTEM)

34.1 Components:-

Panels Construction - Each panel consists of Vertical extrusions 2Nos and Horizontal extrusions made of
1.2mm thick aluminum with duly powder coated at every division of tile/block. Each panel have Bottom frame fabricated for 50-60mm panel comprises of L-channels made of 2mm thick CRCA steel (IS: 513), formed plates of 3mm thick HR steel (IS: 2062) & ERW steel tube of size 35x15x1.6mm thick in oval cross section (IS: 7138) welded together. The complete bottom frame shall be powder coated with an average of 50-60 microns thickness of epoxy powder coating. The Bottom Frame is bolted with the Upright verticals. Each Panel is provided with 2Nos Legs of height 120mm are fixed at the bottom frame of the panel. Legs are fabricated by CO2 welded MS Tube of section 38mm x 25mm (IS: 7138 ERW Tube, 38mm x 25mm x 16bg) with the base plate of the MS plate of 35x22x5mm (IS: 2062, 5mm HR) over which an M8 Leveler is fitted which allows for adjustment of the height by 50mm. It will be coated with 45-50micron thickness of epoxy powder coating. Each Panel consists of 2Nos Intermediate blocks. In a 50-60mm Thick panel intermediate block shall comprise of 38mm thick paper honeycomb with 3mm MDF/ Hollow MDF on each sides and 0.6mm decorative laminate on both sides. Particle board framing shall be used on outer boundary of these blocks as well as intermediately at certain locations forming conduit for passing cables. These blocks will be located in the middle bands of the panels made out of a composite construction of MDF and paper honeycomb/ hollow MDF. Each Panel consists of TOP TILES/SPLIT TILES. These tiles shall be slide in to the panels from top before fixing the top horizontal. These tiles shall be supported from top & bottom side with clips made from PP co polymer fitted in horizontal extrusion. In case of split tiles it shall be offered in Fabric magnetic tiles, Whiteboard tiles. Each Panel consists a BOTTOM TILE. These bottom tiles shall be press fitted on to the assembly frame of the panel with the help of snap on clips made of nylon-66 and support clips made from Polypropylene (PP). All partitions and side panels have levelling screws for adjustment in case of uneven floor to take care of +/- 40 mm of uneven flooring.

34.2 Tile Finishes :

34.2.1 FABRIC MAGNETIC TILES: Fabric magnetic tiles shall be fabric upholstered metal tiles in 0.6 mm thick G.I. Grade O as per IS: 277. The fabrics shall be upholstered with adhesives.

34.2.2 FABRIC TACK TILES: Fabric tackable tiles shall be upholstered metal tiles in

0.6mm thick G.I. grade O as per IS: 277, with Polyurethane foam in the tile for tackablity. The fabric shall be upholstered with adhesives.

34.2.3 WHITE BOARD TILES : White board tiles shall be made of 8.0 mm thick particle board conforming to IS: 12823 laminated with 0.6mm thick white glossy high pressure laminate on outer side & 0.6mm backing laminate on inner surface and will be having all its edges with minimum 0.5 mm thick PVC edging.

34.3 Aluminum Trims: The top trims and end trims for 50-60 mm shall be made from aluminum extrusion. All kinds of extrusions for 50-60mm shall have average wall thickness of 1.2 mm & having finish of powder coating. Top trim in 50-60mm thick panel shall be press fitted on the horizontal extrusion, it shall be slide fitted with the help of top trim connector made from PP copolymer 3530 grade. End trim for 50-60mm thick panel shall be slide fitted with the help of end trim connector made from 2.0mm thick M.S. CRCA Grade D as per IS: 513.

34.4 Legs - System shall also have 120 mm high powder coated welded metal legs to give the system an elevated look. Single side legs are fabricated by CO2 welded MS Tube of section 38 mm x 25 mm (IS: 7138 ERW Tube, 38 mm x 25 mm x 16bg) with the base plate of the MS plate of 35mm x 22mm x 5mm (IS: 2062, 5 mm HR) over which an M8 Leveler is fitted

34.5 End/Intermediate separator: partitions of 22.8mm thick including powder coated aluminum trims and supported on Legs for better air circulation and helps in keeping floor clean. The 22.8 mm panels are only to be used as Separator/End panels to provide additional privacy. These panels have various finishes and no cable management ability.

34.6 Panel Construction: The 22.8mm End/Separator panels shall be made of horizontal and vertical uprights. These uprights and horizontals shall be made of aluminum extrusion having material AL96063-T6 & have average wall thickness of 1.2mm & powder coated with epoxy-polyester powder. The Blocks for the End/Separator panels shall be of 16mm to 18mm thickness in the selected finish. The top most block in the panel shall be the top block of the panel. It shall be available in fabric, laminate, whiteboard, fabric metal, tackable and clear glass finishes. The 2Nos blocks in the intermediate bands shall be available in fabric or laminate finish and the lowermost block in the panel shall be the bottom block which shall be in fabric, metal or laminate finish.

34.7 Tiles: Tile Finishes in End/Separator Partitions to be provided as per the site and layout approval. Finishes in these panels shall be

34.8 LAMINATE FINISH BLOCKS: Laminate finish blocks shall be made from 18mm thick particle board, cladded with 1mm thick laminate of approved shade.

34.9 FABRIC FINISH BLOCKS: These shall be made from 18mm thick Pre-Laminated Particle Board upholstered with 1mm thick approved shade of fabric using adhesives.

34.10 WHITEBOARD BLOCKS: These shall be made of 16mm thick particle board laminated with 0.6mm thick white glossy high pressure laminate on both sides and having all its edges with minimum 0.5 mm thick PVC edging.

34.11 GLASS BLOCKS: These shall be made of 4mm thick toughened plain glass having

diamond polish edge finish.

34.12 FABRIC TACKABLE BLOCKS: These shall be made from 18mm thick Pre-Laminated Board battens which hold 3mm MDF in between. 6mm thick Polyurethane foam shall be pasted on 3mm thick MDF and this assembly shall be upholstered with approved shade of fabric on both sides using adhesive.

34.13 METAL FINISH BLOCKS: Metal finish blocks shall be made from two components of 0.8mm thick M.S. CRCA Grade D as per IS: 513 powder coated with epoxy polyester finish.

34.14 Aluminum Trims: The top trims and end trims for 22.8mm partition shall be made from aluminum extrusion having material AL96063-T6. Top trim in 22.8mm thick panel shall be slide fitted with the help of top trim connector made from PP copolymer 3530 grade. End trim for 50-60mm thick panel shall be slide fitted with the help of end trim connector made from 2.0mm thick M.S. CRCA Grade D as per IS: 513. End trim for 22.8 mm thick panel shall slide with the help of end trim connector made from nylon-66.

34.15 Legs: Legs shall be 120 mm high powder coated welded metal legs. Legs shall be fabricated by CO2 welding MS Tube of section 38mm x 20mm (IS: 7138 ERW Tube) with the base plate of the MS plate of 35mm x 22mm x 5mm (IS: 2062, 5 mm HR) over which an M8 Leveler shall be fitted, The height of the panel leg will be 126mm. This shall be coated with minimum 45 micron thickness of epoxy powder coating.

34.16 Workstation Worktop as per the approved shape and site requirement made out of 25mm thick prelam particle board. All the open edges of work surface shall be provided with machine pressed 2 mm thick PVC lipping glued with hot melt EVA glue. The work surface shall be provided with circular cut out of Dia.65mm as per the requirement, for passing of wires. These cut outs shall be provided with ABS covers. Work surfaces are fitted to the panels by work surface brackets. Brackets are made of 2.0mm thick CRCA grade D steel as per IS : 513-19. Brackets are slide in between end trim and vertical extrusions. The product should be complete and as per approved sample and as per the direction of Architect/EIC/Architect.

Computer Key Board Tray of 480mm (L) X 280mm (D) X 40mm(H) made out of CRCA steel as per IS : 513I made of 0.9mm thick powder coated with sliding channels and other fixtures/fittings. It should also have a sliding system for accommodating mouse. The product should be complete and as per approved sample and as per the direction of Architect/EIC/Architect.

CPU Trolley of Size - 345mm(W) x 226(D) x 180mm(H) is made of 1.0 mm thick MS CRCA Sheet and Side support is made of 0.8 mm thick MS CRCA Sheet. It consists of 4Nos Non-lockable twin wheel castors are injection moulded in Black Nylon. The product should be complete and as per approved sample and as per the direction of Architect/EIC/Architect.

Mobile Pedestal having 3 Drawers Unit having flat metal front and top with Central locking. The Drawer Unit consists of 2Box and 1File Drawers. The Overall size of the Drawer Units is 450mm(W) X 435mm(D) X 646mm(H). Construction & Material of Drawer Unit : Welded Assembled of 0.8 thick CRCA for Body Shell, Drawer Front & tray, Front Side Stiffener, Rear Side Stiffener & Bottom, 1.2mm thick CRCA Top

Stiffener & Bottom stiffener. Drawer Fronts & Metal Front Straight Edge. All Drawers with Double extension precision ball slide shall be provided. For Drawer pulling, side wise tapered recess provided in shell behind Drawer Fronts. Locking:10 lever Cam Lock & Central RH locking with actuator & lock channel mechanism. Top Panel : 0.8mm thick Metal Straight Edge Top. Castors : Swiveling non-lockable 4Nos Castors mounted below the body shell. The Total drawer unit is finished with Epoxy Polyester Powder coated to the thickness of 50 microns (+/-10). The product should be complete and as per approved sample and as per the direction of Architect/EIC/Architect.

34.17 Electrical Fittings and Wire management:-

Wires shall be taken into the system through cable ducts from the junction boxes and it is carried upto the panels through concealed conduits inside the blocks. Wires runs through the system from Bottom tile and extended to the top at various locations by the help of 2 nos. vertical Cable Ducts in each panels. Cable duct shall be made from 0.8 mm thick M.S. CRCA Grade D as per IS: 513 - 1994. It is constructed with two parts, one is body & another is cover. It holds the cables & gives aesthetic appearance by covering all cables entry, which are moving upward to the panels. Size of Cable duct is 107mm W X 154 mm H X 21 mm D.

34.18 **Measurement:** Measurement for payment shall be for each unit for single person seating capacity

35 TILE BASE FULL HEIGHT MODULAR PARTITION

35.1 Frames: -

Partition thickness is 50- 80mm for added stability and main structure shall be a combination of different Aluminum Sections made from Aluminum alloy 63400-WP and shall be powder coated with Epoxy Polyester or Anodized, varying in heights and widths to make a full height cabin up to 3000 mm below the false ceiling level. The frame structure shall be made by joining Aluminum Extrusions by means of brackets made of 3 mm thick HR (IS-2062) and screws. Overall thickness of panel assembly shall be 66 mm. In elevations, the width of tiles shall vary from 300mm to 2400mm in pitch of 150mm and heights shall vary from 600 mm to 2400 mm (actual 534 mm to 2136 mm) in pitch of 600 mm. The system shall provide to make junctions straight partition panels as per approved layout. The super structure above false ceiling level shall consist of True ceiling mounting bracket which shall hold wooden batten frame work made from Rubber wood (50x50xlength of partition). The partition panel extrusions shall be grouted to this superstructure. The system shall have provision for leveling adjustment to compensate for floor unevenness (up to 40 mm) as well as false ceiling height difference (up to 15 mm). Provision shall be provided Horizontal adjustment at wall side with adjustment up to 20 mm.

35.2 Raceways:-

Provision of wire management through the panels vertically shall be possible. Wiring intake into the panel from flooring as well as ceiling shall be provided. Provision in panel width up to 1200 mm width for 2 slots of 100 x 25 at a distance of 100 mm from the edge of the panel shall be provided. Beyond 1200 mm to 2400 mm, the slots shall increase from 2 to 4 nos. the intermediate slots shall be equidistance from the end slots. The end slots shall be same as the ones in the 1200 mm w panels. Provision to provide wire management in full glazed panel in separate power post should be

possible.

35.3 Tiles:- Fabric Tile:

Fabric Non-tack tiles shall be made of 9.0 mm thick PLB / PLT boards(IS: 12823:1990) edge banded with
0.5 mm thick PVC lipping, and upholstered with approved fabric on front side. The overall thickness of tile shall be 10mm.

Glass Tile:

The glass used is 5 mm thick clear Toughened glass or 5mm thick BPG Toughened glass (IS-2835) PVC Rubber extrusion fixed on to the extrusion profile, supports the glass edges from back side

Tackable tile:

Fabric Tackable tiles shall be made of 0.7mm thick GI Sheet (IS-277), with 8mm thick P.E. foam glued to it on front side which are fabric upholstered on front side. The overall thickness of tile shall be 9 mm. Stiffeners made of GI Sheet (IS-277) shall be provided at the back of the tile.

Whiteboard marker tiles:

Back painted glass of 5 mm Shall be provided for glass finished writing board in the panel itself.

Laminate Tile:

Wooden DL tile of 9 mm thick PLB edge banded with 0.5 mm thick PVC lipping with approved design of laminate shade shall be provided as per approved panel elevations.

35.4 Wire Management: -

Provision of wire management through the panels vertically shall be possible. Wiring intake into the panel from flooring as well as ceiling shall be provided. Provision in panel width up to 1200 mm width for 2 slots of 100 x 25 at a distance of 100 mm from the edge of the panel shall be provided. Beyond 1200 mm to 2400 mm, the slots shall increase from 2 to 4 nos. the intermediate slots shall be equidistance from the end slots. The end slots shall be same as the ones in the 1200 mm w panels. Provision to provide wire management in full glazed panel in separate power post should be possible.

36.0 TILE BASE LOW HEIGHT MODULAR PARTITION

36.1 Frame:-

Each panel consists of Vertical extrusions 2Nos and Horizontal extrusions made of 1.2mm thick aluminium with duly powder coated at every division of tile/block. Each panel have Bottom frame fabricated for 50- 60mm panel comprises of L-channels made of 2mm thick CRCA steel (IS: 513), formed plates of 3mm thick HR steel (IS: 2062) & ERW steel tube of size 35x15x1.6mm thick in oval cross section (IS: 7138) welded together. The complete bottom frame shall be powder coated with an average of 50-60 microns thickness of epoxy powder coating. The Bottom Frame is bolted with the Upright verticals. Each Panel is provided with 2Nos Legs of height 120mm are

fixed at the bottom frame of the panel. Legs are fabricated by CO2 welded MS Tube of section 38mm x 25mm (IS: 7138 ERW Tube, 38mm x 25mm x 16bg) with the base plate of the MS plate of 35x22x5mm (IS: 2062, 5mm HR) over which an M8 Leveler is fitted which allows for adjustment of the height by 50mm. It will be coated with 45-50micron thickness of epoxy powder coating. Each Panel consists of 2Nos Intermediate blocks. In a 50-60mm Thick panel intermediate block shall comprise of 38mm thick paper honeycomb with 3mm MDF/ Hollow MDF on each sides and 0.6mm decorative laminate on both sides. Particle board framing shall be used on outer boundary of these blocks as well as intermediately at certain locations forming conduit for passing cables. These blocks will be located in the middle bands of the

panels made out of a composite construction of MDF and paper honeycomb / Hollow MDF. Each Panel consist of TOP TILES/SPLIT TILES. These tiles shall be slide in to the panels from top before fixing the top horizontal. These tiles shall be supported from top & bottom side with clips made from PP co polymer fitted in horizontal extrusion. In case of split tiles it shall be offered in Fabric magnetic tiles, Whiteboard tiles. Top Tiles can be offered in Fabric Magnetic, Fabric Tack tiles, White Board tiles as per approval of Architect/ Engineer. Each Panel consists a BOTTOM TILE. These bottom tiles shall be press fitted on to the assembly frame of the panel with the help of snap on clips made of nylon-66 and support clips made from Polypropylene(PP). All partitions and side panels have levelling screws for adjustment in case of Uneven floor to take care of +/- 40 mm of uneven flooring.

36.2 Wire Management: -

Wires shall be taken into the system through cable ducts from the junction boxes and it is carried up to the panels through concealed conduits inside the blocks. Wires runs through the system from Bottom tile and extended to the top at various locations by the help of 2 nos. vertical Cable Ducts in each panels. Cable duct shall be made from 0.8 mm thick M.S. CRCA Grade D as per IS: 513 - 1994. It is constructed with two parts, one is body & another is cover. It holds the cables & gives aesthetic appearance by covering all cables entry, which are moving upward to the panels.

Size of Cable duct is 107mm W X 154 mm H X 21 mm D. Legs - System shall also have 120 mm high powder coated welded metal legs to give the system an elevated look. Single side legs are fabricated by CO2 welded MS Tube of section 38 mm x 25 mm (IS: 7138 ERW Tube, 38 mm x 25 mm x 16bg) with the base plate of the MS plate of 35mm x 22mm x 5mm (IS: 2062, 5 mm HR) over which an M8 Leveler is fitted.

36.3 Tiles:-

Tile Finishes in End/Separator Partitions to be provided as per the site and layout approval. Finishes in these panels shall be

- LAMINATE FINISH BLOCKS: Laminate finish blocks shall be made from 18mm thick particle board, cladded with 1mm thick laminate of approved shade.

- FABRIC FINISH BLOCKS: These shall be made from 18mm thick Pre-Laminated Particle Board upholstered with 1mm thick approved shade of fabric using adhesives.

- WHITEBOARD BLOCKS: These shall be made of 16mm thick particle board laminated with 0.6mm thick white glossy high pressure laminate on

both sides and having all its edges with minimum
0.5 mm thick PVC edging.

• GLASS BLOCKS: These shall be made of 4mm thick toughened plain glass having diamond polish edge finish.

• FABRIC TACKABLE BLOCKS: These shall be made from 18mm thick Pre-Laminated Board battens which hold 3mm MDF in between. 6mm thick Polyurethane foam shall be pasted on 3mm thick MDF and this assembly shall be upholstered with approved shade of fabric on both sides using adhesive.

• METAL FINISH BLOCKS: Metal finish blocks shall be made from two components of 0.8mm thick
M.S. CRCA Grade D as per IS: 513 powder coated with epoxy polyester finish.

20. Modes of Measurements: -

i. The scope of measruement indicated herein below shall be maintained by the Contractor for the purpose of record measurement. The E-I-C, if required, may seek the details of these measurements for verification etc.
ii. All equipments, machinery, apparatus and materials required as well as the cost of any tests which the CLIENTS may request in addition to the tests generally required to prove quality and performance of the equipments.
iii. All the labour required supplying and installing the complete installation in accordance with the specifications.
iv. Use of any tools, equipments, machinery, lifting tackle, scaffolding, ladders etc. Required by the Contractor to carry out his work.
v. All the necessary measures to prevent the transmission of vibration.
vi. The necessary material to isolate equipments foundations from the building structure, wherever necessary. Storage and insurance of all equipments apparatus and materials.
vii. The Contractor's quoted price shall include all equipment, apparatus, material and labour indicated in the drawings and/or specifications in conjunction with the item in question, as well as all additional equipment, apparatus, material and labour usual and necessary to make in question on its own (and within the system as a whole) complete even though not specifically shown, described or otherwise referred to.

Other terms and conditions

1. General:

i. The work shall broadly include construction of all the civil, structural, finishing, plumbing and pipeline works related to buildings and foundations which includes earth work, plain & reinforced cement concrete, reinforcement, scaffolding, formwork, masonry work, floor finishing, plastering, etc. as well as supply of all materials, consumables, labour, tools and plants, transportation and storage, sample testing etc.; all complete as per BOQ, specifications.
ii. The materials, design and workmanship shall satisfy the relevant Indian Standard, KPWD/CPWD specification, most specifications and the Specifications contained herein and codes referred to. Where the Specifications stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall be approved by the Engineer – in – charge. In case of any ambiguity, sound engineering practices shall prevail and the decision of engineer in charge in such matters shall be final.
iii. The detailed specifications given hereinafter are for the items of works described in the schedule of quantities attached herein, and shall be guidance for proper execution of work to the required standards. It may also be noted that the specifications are of generalized nature and these shall be read in conjunction with the description of item in schedule of quantities. The work also includes all minor details of construction which are obviously and fairly intended and which may not

have been referred to in these documents but are essential for the entire occupation in accordance with standard Engineering practice.

iv. Unless specifically otherwise mentioned, all the applicable codes and standards published by the Indian Standard Institution and all other standards which may be published by them before the date of receipt of tenders, shall govern in all respects of design, workmanship, quality and properties of materials and methods of testing, methods of measurements etc. Wherever any reference to any Indian Standard Specifications occurs in the documents relating to this contract, the same shall be inclusive of all amendments issued thereto or revision thereof, if any, up to the date of receipt of tenders.

v. Wherever any reference to any Indian Standard Specification occurs in the documents relating to this contract the same shall be inclusive of all amendments issued thereto or revisions thereof, if any, up to the date of receipt of tenders. In case there is no I.S.I. specification for the particular work, such work shall be carried out in accordance with the instructions in all respects, and requirements of the Engineer-in-Charge. The work shall be carried out in a manner complying in all respects with the requirements of relevant bye-laws of the Municipal Committee/Municipal Corporation/Development Authority under the jurisdiction of which the work is to be executed or as directed by the Engineer-in-Charge and, unless otherwise mentioned, nothing extra shall be paid on this account.

vi. The contractor shall take instructions from the Engineer-in-charge regarding collection and stacking of materials in any place. Unserviceable materials shall be stacked such that it does not hamper the day-to-day movement of people/office staff/ visitors etc.

vii. BRBNMPL is ISO 9001 – 2015, ISO 14001: 2015 and ISO 45001:2018 certified company. The contractor in all respects shall organize his work, systems, environment, process control documentation, tools, plant, inspection, measuring and testing equipment's etc. as per instructions of Engineer.

viii. The contractor shall also comply with applicable legislation and regulations with regards to Health, safety and environmental aspects for minimizing risk arising from occupational health, safety hazards, controlling pollution and wastage.

ix. BRBNMPL may depute their representative for checking and supervision of important stages of work. The contractor shall be required to provide all facilities for inspection of works at no extra cost to BRBNMPL. Any defect in quality of work or deviations from drawings / specifications pointed out during such inspection shall be made good by the contractor in the same way as if pointed out by the Engineer, without any cost implication to BRBNMPL.

x. All works shall be taken over by BRBNMPL in part or in full when it has been completed in all respects and /or can be put to use satisfactorily. The complete work under the contract shall be taken over only after completion of all punch points, pending work, rework wherever required, site clearing and reconciliation of materials.

xi. The guarantee period shall start only after the complete work under the contract has been taken over by BRBNMPL.

xii. The Rates quoted shall include necessary Staging, Scaffolding for all heights & levels. No Additional rates shall be entertained for Staging and Scaffolding.

All works shall comply with relevant IS codes and KPWD/CPWD standards and specifications.

2. **Good for Construction Drawings:** The successful bidder shall request for GFC Drawings from Architect well before time to avoid any delay. Any further data required for the project shall be obtained by the contractor from the architect well before time to avoid any delay.

3. **Instructions and Measurements:** The contractor shall strictly adhere to the written instructions of the BRBNMPL. Measurements shall be recorded of the actual work done. However, the quantum of work over and above that indicated in the working or detail drawings shall not be recorded. The mode of measurement shall be generally in accordance with IS - 1200 Method of Measurement for Building and Civil Engineering Works unless otherwise specified.

4. **Additional conditions for cement, steel brought by the contractor:**

i. All the materials required for construction of work shall be arranged by the contractor at his own cost. The samples of material to be procured shall be got approved by the Engineer-in-charge and material as per approved samples shall only be procured.

ii. The contractor shall submit periodically as well as on completion of work, an account of all materials brought by him in a manner as directed by Engineer-in-charge. The contractor shall also furnish monthly account of materials; a separate register shall be maintained on site for recording daily item wise receipt and consumption of Cement, Steel used by him, also item wise consumption of other materials used. This register shall be signed daily by the contractor or his representative and representative of Engineer-in-charge.

iii. In each case, certificate for its quality and quantity shall be produced by the contractor at his own cost and the test results of samples shall be supplied to the Department. The material not confirming to the required standard shall be removed at once from the site of the work by the Contractor at his own cost.

iv. Testing of all construction material, if any shall be carried out as per required frequency and specifications and the charges for testing shall be borne by the contractor

v. All the testing charges for mix design etc. if necessary on construction work shall be borne by the contractor.

vi. The contractor shall construct shed / sheds as per direction of the Engineer-in-charge of the work for storing the materials brought at site. The material shall be taken out for use in the presence of the departmental representative only.

vii. The contractor shall make his own arrangement for the safe custody of the materials which are brought for construction of work.

viii. The contractor shall not transfer any material once brought at work site without prior written permission from Engineer-in-charge and for bonafide reasons only

ix. In case the materials brought by the contractor become surplus owing to the change in the design of the work, the materials should be taken back by the contractor at his own cost after prior permission of the Engineer-in-charge.

x. The charge for conveyance of materials from the place of delivery to the site of work and the actual sport on work site shall be entirely borne by the contractor. No claims on his account shall be entertained.

xi. The contractor shall furnish the account of cement, steel, asphalt brought by him at each time before placing orders for further supply. Also the same should submit on completion of the work, final account of the materials used by him to the Department. This account will be scrutinized by the Engineer-in-charge

5. **Civil and Structural Works:**

i. Setting out of works:

The Contractor shall set out of the works and shall be responsible for the true and perfect setting out of the same and for the correctness of the positions, levels, dimensions and alignment of all parts thereof. If at any time error in this respect shall appear during the progress of the works or even after the completion of the works; the Contractors shall, if so required, at his own expense rectify such error to the satisfaction of the Engineer in Charge/BRBNMPL. The rate of site clearance is deemed to be included in the rate of earth work for which no extra will be paid.

ii. Excavation:

a) The excavation in foundation shall be carried out in true line and level and shall have the width and depth as directed. The bottom of the excavated area shall be levelled both longitudinally and transversely as directed by removing and watering as required. The excavated earth of the selected type shall be used in filling the trenches and plinth or levelling the ground in layers including ramming and watering etc.

b) The earth to be used for filling shall be free from salts, organic or other foreign matter. All clods of earth shall be broken. As soon as the work in foundation has been completed and measured the site of foundation shall be cleared of all debris, brick bats: mortar dropping etc., and filled with earth in layers not exceeding 20 cms. Each layer shall be adequately watered, rammed and consolidated before the succeeding layer is laid. The finished level of filling shall be kept to shape intended to be given to floor.

iii. Shuttering:

a) The timber used in shuttering shall not be so dry as to absorb water from concrete and swell or bulge nor so green or wet as to shrink after erection. The timber shall be properly sawn and planed on the sides and surface coming in contact with concrete. The shuttering shall be supported on battens and beams and props of vertical bellies properly cross braced together so as to make the centering rigid.

b) The form work shall be sufficiently strong and shall have camber, so that it assumes correct shape after deposition of the concrete and shall be able to resist forces caused by vibration of live load of men working over it and other incidental loads associated with it. The shuttering shall have smooth and even surface and its joints shall not permit leakage of cement grout.

c) If at any stage of work during or after placing concrete in the structure, the form work sags or bulges out beyond the required shape of the structure, the concrete shall be removed and work redone with fresh concrete and adequately rigid form work. The complete form work shall be got inspected by and got approved from the Engineer-in-charge, before the reinforcement bars are placed in position.

iv. Reinforcement Works:

a) The work shall consist of furnishing and placing reinforcement to the shape and dimensions shown as on the drawings or as directed. Steel shall be clean and free from rust and loose mill scale at the time of fixing in position and subsequent concreting. Reinforcing steel shall conform accurately to the dimensions given in the bar bending schedules shown on relevant drawings. Bars shall be bent cold to specified shape and dimensions or as directed using a proper bar bender, operated by hand or power to attain proper radius of bends. Unless otherwise specified a „U" type hook at the end of each bar shall invariably be provided to main reinforcement. The hooks shall be suitably encased to prevent any splitting of the concrete.

b) All the reinforcement bars shall be accurately placed in exact position shown on the drawings and shall be securely held in position during placing of concrete by annealed binding wire not less than 1 mm. in size and by using stay blocks or metal chair spacers, metal hangers, supporting wires or other approved devices at sufficiently close intervals. Bars shall not be allowed to sag between supports nor displaced during concreting or any other operations of the work. Reinforcement after being placed in position shall be maintained in a clean condition until completely embedded in concrete. To prevent reinforcement from corrosion, concrete cover shall be provided.

v. Concrete works;

a) The Proportion of cement, sand and coarse aggregate shall be as mentioned in the BOQ for specific work enumerated and shall be measured by volume. The minimum quantity of cement used in cement concrete of specific grade has to be maintained strictly as per IS code. The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be allowed for smaller quantity of work if approved by the Engineer-in-charge. The concrete shall be handled from the place of mixing to the final position in not more than 15 minutes by the method as directed and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences. Workability of the concrete shall be controlled by maintaining a water-cement-ratio that is bound to give a concrete mix which is just sufficiently wet to be placed and compacted without difficulty with the means available. The degree of consistency which shall depend upon the nature of the work and methods of vibration of concrete, shall be determined by regular slumps tests in accordance with IS Code.

b) Contractor shall give the Engineer-in-charge due notice before placing any concrete in the forms to permit him to inspect and accept the false work and forms as to their strength, alignment, and general fitness but such inspection shall not relive the contractor of his responsibility for the safety of men, machinery, materials and for results obtained. No concrete shall be placed in any part of the structure until the approval of the Engineer-in-charge has been obtained.

c) Concerting shall proceed continuously over the area between construction joints. Fresh concrete shall not be placed against concrete which has been in position for more than 30 minutes unless a proper construction joints is formed. Concrete shall be compacted in its final position within 30 minutes of its discharge from the mixer.

d) Concrete shall not be dropped into place from a height exceeding 2 meters. When trunking or chutes are used they shall be kept close and used in such a way as to avoid segregation. When concreting has to be resumed on a surface which has hardened, it shall be roughened, swept clean, thoroughly wetted and covered with a 13 mm. thick layer of mortar composed of cement and sand in the same ratio as in the concrete mix itself.

e) All concrete shall be compacted to produce a dense homogeneous mass with the assistance of vibrators, unless otherwise permitted by the Engineer-in-charge for exceptional cases, such as concreting under water, where vibrators cannot be used. Sufficient vibrators in serviceable condition shall be kept at site so that spare equipment is always available in the event of breakdowns.

f) Immediately after compaction, concrete shall be protected from weather, including rain, running water, shocks, vibration, traffic, rapid temperature changes, frost and drying out process. It shall be covered with wet sacking, hessian or other similar absorbent material approved soon after the initial set and shall be kept continuously wet for a period of not less than 14 days from the date of placement. Masonry work over foundation concrete may be started after 48 hours of its laying but curing of concrete shall be continued for a minimum period of 14 days.

g) Samples from fresh concrete shall be taken as per IS Code provisions and cubes shall be made, cured and tested at 7 days or 28 days as per requirements in accordance with IS code. A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested i.e. the sampling should be spread over the entire period of concreting and cover all mixing units.

h) No additional cost shall be paid for Continuous De- Watering for all foundation works

i) The RMC shall be obtained from the approved RMC plant from outside for RMC works based on the approved design mix for which necessary certificate should be furnished. Regarding minimum cement content relevant IS specifications shall prevail. Only Ordinary Portland cement shall be used for RMC Works.

j) Clearance for site mix (with approved weigh batched designed concrete mix) under special circumstances to be taken from EIC.

k) Rate quoted for RMC/Site Mix Concrete shall be for all floors and at all levels and no additional charges are payable towards lift.

l) Use of admixture, its type, dosage and conditions of its use shall be as per design mix and no extra cost is admissible in this regard.

m) Design Mix with trial cubes strength shall be got approved from consultants well in advance before commencement of RCC works.

vi. Formwork:

a) Providing and removing centering, shuttering, strutting, propping etc, and removal of form work for compound wall, foundations, footings ,rafts, pedestals for mass concrete including cost of all materials, labour complete as per specifications.

b) Providing and erecting Formwork for RCC Compound Wall / at all levels and places with plywood lining, of all shapes and sizes, at all levels & heights, providing grooves of various shapes and sizes including scaffolding, releasing & removing the formwork, etc; complete as per specifications

c) Providing, fabricating and erecting form faced formwork at all levels and places wherever needed / specified as per drawing including striking / deshuttering with necessary safety precautions.

d) Material :12mm thick Marine grade or film faced plywood of high density (34 Kg) of make Green Ply/Virgo/Archid Ply/Somany / equivalent should be used and shall be repeated upto a maximum of 10 repetitions. (5 repetitions on each side) with surface treatments that provide a nearly impervious and smooth surface.

Mixing different brands or surface treatments should be avoided to avert variations in colour caused by amount of water absorption.

e) Shuttering Oil for all Slabs, Beams, Shear walls, Columns, Chajjas etc shall be of Rebbol -E from M/s. Fosroc, Sika Form Oil from M/s. Sika & Dr. Fixit De-shuttering Oil from M/s. Dr.Fixit / equivalent of reputed make

f) Form Liners: Form Liners in concrete works upto 600mm in height for elevation with white band shall be of foam liner made out of fiber glass fixed to the form work. Texture finish of fiber glass shall be as per architects requirement. The Form Liner to be match with the Existing Building.

g) Accuracy: Form faced formwork should be designed, constructed and maintained in accordance with detailed specifications, recommendations of ACI 347-04 and additional requirements out lined. Form faced concrete requires care in design to minimize deflection, deformations, pillowing, offsets and mortor leakage. Specified clearances between reinforcement and formwork should be maintained.

h) Form face should be designed as a stable envelop to contain the fresh concrete, extra walers, additional ties and bracings to be provided to satisfy the deflection requirements and also to maintain alignment during vibrating of concrete.

i) Form joints: Leakage should be minimized for uniform colur and texture are critical. Leakage shall be minimized by providing lining forms with separate materials and staggering the joints using pressure sensitive compressible gaskets / tapes or sealant with in form interfacing joints. Care should be taken to prevent displacement of tape / gaskets during concrete operations. A mock up panel to be done to verify the effectiveness of taped joints.

j) Form Release agents : Material applied to the form sheathing to prevent the bonding of concrete to the sheathing, to keep the formwork clean and assist in the successful production of high quality architectural surfaces.

k) For Uniformity of appearance, the same release agent should be used for all architectural concrete surfaces.

l) Chemically active release agents shall be used. Fatty acids chemically react with basic materials in concrete and produce soap. Soap is better lubricant than oil for removal of entrapped air in fresh concrete.

m) Providing of Grooves of Various Sizes in Exposed Concrete works 20x12mm , 12mmx12mm & 50mm x 12mm made of PVC.

vii. Concrete Block Works:

a) Hollow or solid concrete blocks shall conform to IS 2185 and shall be regular in size and shape and of the specified strength.

b) Blocks shall be properly cured before being brought to Site and shall have a texture such that plaster and/or render will readily adhere to it.

c) The Contractor shall supply samples for the approval of the Engineer and all blocks supplied shall conform strictly to the approved samples.

d) Half or three quarter size blocks may be used wherever required to make up lengths of walls but broken blocks shall not be used.

e) Pre-cast concrete screen or special blocks or 'jalli' work for decorative purposes shall be as specified on the drawings or as directed by the Engineer. Sample blocks shall be submitted to the Engineer for approval and blocks supplied shall strictly conform to the approved samples.

f) Mortar shall be prepared in accordance with IS 2250. Mixes for cement mortar shall be as specified for the respective items of work. Cement shall be ordinary Portland cement as described in Specification 2.2.

g) Sand shall be natural sand in accordance with IS 383, passing a 4.75mm size IS sieve, and shall be free from clay, shale, loam, alkali, organic and other deleterious matter and shall be of sound, hard, clean and durable particles. Sand shall be approved by the Engineer and, if so directed, shall be thoroughly washed until it is free of any contamination.

h) Gauge boxes for sand shall be of such dimensions that one complete 50Kg bag of cement forms one unit.

i) For the preparation of cement mortar the ingredients shall first be thoroughly mixed dry. Water shall then be added and the mixing continued until a uniform mix of the required consistency is achieved.

j) Cement mortar shall preferably be machine mixed, though hand mixing in troughs may be allowed with the approval of the Engineer. Mortar so mixed shall be used within 25 (twenty five) minutes of mixing. Mortar left unused within the specified period shall be rejected and disposed of by Contractor to satisfaction of the Engineer. Re-tempering of mortar shall not be permitted.

k) The Contractor shall arrange at his own cost for tests on mortar samples, if so directed by the Engineer.

l) Workmanship:

A. Block work shall be plumb, square and properly bonded with broken joints. The thickness of the courses shall be uniform with courses horizontal. All connected work shall be carried out at one level and no portion of the work shall be left more than one course lower than the adjacent work.

B. Blocks shall be laid so that all joints are well filled with mortar. Joined shall not be less than 6mm and not more than 8mm thick. Face joints shall be raked to a minimum depth of 10mm by raking tools during the progress of work when the mortar is still green so as to provide a proper key for pointing, plastering or rendering. When pointing, plastering or rendering is not required joints shall be struck flush.

C. For pointed block work or block work without plaster or render approved, smooth textured concrete blocks shall be used.

D. Faces of block work shall be cleaned daily and all mortar droppings cleaned off and removed. Top surfaces of each course shall be thoroughly cleaned before other courses are laid. If mortar in lower courses has begun to set joints shall be raked out to a depth of 12mm before laying is continued.

E. Where blocks are to be used for load bearing walls the uppermost course of blocks supporting slabs or other structural members shall be solid or treated as directed by the Engineer.

F. Miscellaneous inserts in block work, e.g. sleeves, wall ties, anchors, conduits, structural steel, steel lintels and the like shall be installed by the Contractor and these items shall be deemed to be included in the quoted rates for block work. The supply of such inserts by the Contractor will be paid separately in accordance with the relevant items of the Bill of Quantities.

G. Openings, arches, chases, pockets and the like shall be provided as required.

H. It shall be clearly understood that the rates quoted by the Contractor shall be deemed to include for leaving openings, Forming arches, cutting chases pockets and the like in block work for various trades.

viii. Fabrication:

a) The fabrication of structures with steel tubes shall generally conform to IS 806. The general provisions in Section V of IS 800 are also applicable to the fabrication of structures using steel tubes. Where welding is adopted, reference to appropriate provision of IS 820 and IS 816 shall be made.

b) The component parts of the structure shall be assembled in such a manner that they are neither twisted nor otherwise damaged and be so prepared that the specified cambers, if any, are maintained.

c) Straightening: All materials before being assembled, shall be straightened unless required to be of a curvilinear form and shall be free from twists.

d) Bolting: Washers shall be specially shaped where necessary or other means used, to give the nuts and the heads of the bolts a satisfactory proper bearing.
In all cases where the full bearing area of the bolt is to be developed, the threaded portion of the bolt shall not be within the thickness of the parts bolted together, and washers of appropriate thickness shall be provided to allow the nut to be completely tightened.

e) Cut edges: Edges should be dressed to a neat and workmanlike finish and be free from distortion where parts are to be in contact, metal to metal.
For tube to tube connections the cutting of individual members shall be done with Profile Cutting Machines only.

f) Caps and bases for columns: The ends of all tubes for columns, transmitting loads through the ends, should be true and square to the axis of the tube and

should be provided with a cap or base accurately fitted to the end of the tube and screwed, welded or shrunk on. The cap or base plate should be true and square to the axis of the column.

g) Connections:

A. Connections in structures using steel tubes shall be provided by welding, riveting or bolting. Wherever possible, connections between tubes shall be made directly, tube to tube without gusset plates and other attachments. Ends of tubes may be flattened as specified or otherwise formed to provide for welded, riveted or bolted connections.

B. Eccentricity of members: Tubes meeting at a point, shall wherever practicable, having their gravity axes, meeting at a point so as to avoid eccentricity.

C. Eccentricity of connections: Wherever practicable, the center of resistance of the connection shall lie on the line of action of the load, so as to avoid eccentricity moment of connection.

D. Tolerances: The tolerances as mentioned in (IS 1161-1979) shall apply.

E. Sealing of tubes: When the end of a tube is not automatically sealed by the virtue of its connection by welding to another member, the end shall be properly and completely sealed. Before sealing, the inside of the tube should be dry and free from loose scale.

F. Flattened ends: In tubular construction, the ends of tubes may be flattened or otherwise formed to provide for welded, riveted or bolted connections provided that the methods adopted for such flattening do not injure the material. The change of section shall be gradual

G. Welded connections: A weld connecting two tubes end to end, shall be full penetration butt weld. The effective throat thickness of the weld shall be taken as the thickness of the thinner part joined.

A weld connecting the end of one tube (branch tube) to the surface of another tube (main tube) with their axes at an angle of not less than 30 degrees shall be of the following types:

a) A butt weld throughout

b) A fillet weld throughout, and

c) A fillet-butt weld, the weld being a fillet weld in one part and a butt weld in another with a continuous change from one form to the other in the intervening portions.

Type (a) may be used whatever the ratio of the diameters of the tubes joined, provided complete penetration is secured either by the use of backing material, or by depositing a sealing run of metal on the back of the joint, or by some special method of welding. When type (a) is not employed, type (b) should be used where the diameter of the branch tube is less than 1/3rd of the diameter of the main tube, and type (c) should be used where the diameter of the branch tube is equal to or greater than 1/3rd of the diameter of the main tube.

H. Angle between tubes: A weld connecting the end of one tube to the surface of another, with the axes of the tubes intersecting at an angle of less than 30 degrees, shall be permitted only if adequate efficiency of the junction has been demonstrated.

6. **Maintenance of Records & Documentation:**

It shall be the sole responsibility of the contractor to maintain all the necessary records and documentation pertaining to the project works. Some of the important documents re listed below:

i. Site order Book:

The contractor shall himself engage an authorized all time site engineer/supervisor / agent on the work capable of managing and guiding the work and understanding the specifications and contract conditions. A qualified and experienced person shall be provided by the contractor as his agent for technical matters. Site engineer can also be designated as an agent of the contractor. Agent will take orders as will be given by the Engineer in charge or his representative and shall be responsible for carrying them out. This agent shall not be changed without prior intimation of the Engineer in charge and his

representative on the work site. The Engineer-in-charge have the unquestionable right to ask for changes in the quality and strength of supervisory staff of contractor and to order removal from work of any of such staff. The contractor shall comply with such order and effect replacements of the satisfaction of the Engineer-in-charge.

A Site order book shall be maintained on site and it shall be the property of BRBNMPL and the contractor shall promptly sign orders given therein by the Engineer in charge or his representative and his superior officer, and comply with them. The compliance shall be reported by contractor to the Engineer in charge in good time so that it can be checked. The contractor will be allowed to copy out the instruction therein from time to time.

ii. Progress Reports

iii. Material Register

iv. Quality / Test Certificates / Batch / MSDS / Design Mix / MTC etc.

v. Hindrance Register :

In order to have a record of hindrances in the progress of work which may result in delays and consequent claims for extension of time, a Hindrance Register shall be maintained at the construction site. The details of the hindrances with time period shall be recorded by the BRBNMPL Officer therein as and when these occur and all recordings shall be signed jointly by the BRBNMPL Officer and the contractor's representative. While considering the contractor's request for extension of time for completion of work, this register shall be referred to. BRBNMPL shall maintain such register and same should be in the custody of the BRBNMPL. Genuine and acceptable hindrances to their work recorded in this register will only be considered for extension of time.

7. **Utility Services:**

Connection for water and power at one point shall be provided at site. It shall be the responsibility of the contractor to draw them. Water / electricity shall be provided free of cost.

8. **Clean Up of Site Work:**

i. Storage of materials shall have to be done at the designated area only.

ii. The area has to be cleaned / cleared at the end of the day's work as this is a functioning office.

iii. Disposal of debris/items to be done at periodic intervals to avoid spillage and over stacking of debris.

iv. BRBNMPL shall only provide space for storage of items. The contractor shall be responsible for safe custody of items/materials/debris/scrap.

v. During execution, the contractor shall without any additional payment, at all times keep the working and storage areas used by him, free from accumulation of waste materials or rubbish. Before completion of all works and handing over of the site, he shall remove or dispose of in a satisfactory manner all excess materials, temporary structures, waste and debris and leave the premises in a condition satisfactory to BRBNMPL.

भाग /Section VIII: गुणता नियंत्रण आवश्यकताएँ /निविदाकर्ता द्वारा घोषणा/ Quality Control Requirements/Declaration by the tenderer

The quality control requirement shall be in line with Section VII: Technical Specifications.

*****

Quality Control Requirements - Compliance

Bidders may note the following parameters and satisfy themselves that they fulfil all the criteria before bidding: -

Sl. No.	Parameter	Accepted by Bidder	Remarks
1.	**The quality control requirement shall be in line with Section VII: Technical Specifications.**	**Accepted**	

We have accepted the above parameters and are satisfied that we fulfil all the criteria for bidding in the tender. We shall comply with, abide by, and accept without variation, deviation, or reservation all requirements detailed in Section VIII: Quality Control Requirements.

Signature of Authorized Signatory with Date and Seal

भाग / Section IX: योग्यता / अर्हकता के मापदंड / Qualification / Eligibility Criteria

Parameter		Qualifying criteria
Quality		The bidder should possess ISO 9001 for QMS certification as on date of opening of tender (Technical Bid Part-1).
Experience & Past Performance		The Bidder should have experience of having successfully completed similar works during the last 07 (seven) years ending last date of previous month in which tender is floated: a) Three similar completed works each costing not less than the amount equal to 40% of the estimated cost **(i.e., ₹98.00 Lakh)**; OR b) Two similar completed works each costing not less than the amount equal to 50% of the estimated cost **(i.e., ₹122.50 Lakh)**; OR c) One similar completed work costing not less than the amount equal to 80% of the estimated cost **(i.e., ₹196.00 Lakh)**. ***Similar work means 'civil, interior & MEP (Mechanical, Electrical & Plumbing) works like interior works / construction / modification / renovation works, etc. which includes the following items of work in a single PO/WO (comprehensive PO/WO including civil, interior, electrical, MEP (Mechanical, Electrical & Plumbing), etc.):*** ***1. Glazing system with DGU vision panel of Minimum value Rs. 18.25 Lakh*** ***2. Interior works including Work Stations, Electrical Works, Plumbing and Sanitary Works*** ***Sub Contracted works will not be considered.*** **Relaxation** Bidders applying as **Class-I & Class-II local suppliers and Start-ups (whether MSEs or otherwise)** shall be eligible for relaxation of norms with regard to **prior experience**. [Please refer SIT provision for GIT clause No. 31 under 'Section III: Special Instructions to Tenderers (SIT)'].
Status		**The bidder should be currently in similar business and in sound financial condition.**
Financial Standing	**Average Annual Turnover**	Average Annual Turnover of the Bidder Firm during **last Three financial years** ending **31/03/2023** should be at least **₹73.50 Lakh.** **Relaxation** Bidders applying as **Class-I & Class-II local suppliers and Start-ups (whether MSEs or otherwise)** shall be eligible for relaxation of norms with regard to **prior turnover**. [Please refer SIT provision for GIT clause No. 31 under 'Section III: Special Instructions to Tenderers (SIT)'].
	Net worth	The Net Worth of the Bidder Firm, a) should not be **Negative** as on **31/03/2023,** and also b) should not have eroded by more than **30%** year-on-year in the **last three financial years** ending **31/03/2023**

Note: -

1. Bidders applying as **Class-I & Class-II local suppliers and Start-ups (whether MSEs or otherwise)** shall be eligible for relaxation of norms with regard to **prior experience and prior turnover**. [Please refer SIT provision for GIT clause No. 31 under 'Section III: Special Instructions to Tenderers (SIT)'].

2. **Documents wrt Experience & Past Performance:** Following documents are required to be submitted along with the bid as part of the Pre-Qualification Criteria:

   a) Copies of **Purchase/Work Orders** executed by the firm along with **PO/Work completion certificate** issued by the customer to be submitted towards above qualifying criteria along with **Annexure 9 "Performance Statement",** duly filled in and digitally signed.

   b) All experience, past performance and capacity / capability related data should be certified by the authorized signatory of the bidder firm.

   c) The credentials regarding experience and past performance to the extent required as per qualification criteria submitted by the bidder may be verified by BRBNMPL from the parties for whom work has been done.

3. **Documents wrt Financial Standing:** Following documents are required to be submitted along with the bid as part of the Pre-Qualification Criteria:

   a) Bidders whose sales, **turnover** or gross receipts is **more than ₹1 crore** during last 3 Financial Years ending **31/03/2023,** are required to submit **audited books of accounts bearing a valid UDIN**. However, for firms whose cash receipts are limited to 5% of the gross receipts or turnover, and whose cash payments are limited to 5% of the aggregate payments, the threshold limit of ₹1 crore for tax audit is increased to ₹10 crore with effect from AY 2021-22 (FY 2020-21).

   b) Bidders whose sales, **turnover** or gross receipts is **less than ₹1 crore** during last 3 Financial Years ending **31/03/2023** are **not** required to submit audited books of accounts. However, they may submit a statement of their turnover and net worth as per **Annexure 10** "Statement of Financial Standing" **certified by a CA bearing a valid UDIN** or a self-certified statement of their turnover and net worth as per Annexure 10 along with IT returns and ITR acknowledgement of last 3 Financial Years ending **31/03/2023.**

   c) In case of Indian Bidders/companies who have been restructured by Banks in India, under the statutory guidelines, they would be deemed to have qualified the Financial standing criteria considering the institutional financial backing available to them.

4. **Manufacture under license / technology collaboration agreements with phased indigenization under 'Make in India'**

   Suppliers may be exempted from meeting the stipulated local content if the product is being manufactured in India under a license from a foreign manufacturer who hold intellectual property rights and where there is a technology collaboration agreement / transfer of technology agreement for indigenous manufacture of a product developed abroad with clear phasing of increase in local content within the validity of the contract.

5. **Applicability in Special cases**

   A) Applicability to 'Make in India'

   (i) Bidders who have a valid / approved ongoing 'Make in India' agreement / program and who while meeting all other criteria above, except for any or more of sub-criteria in Experience and Past Performance above, would also be considered to be qualified provided:

a) their foreign 'Make-in-India' associates meets all the criteria above without exemption, and

b) the Bidder submits appropriate documentary proof for a valid / approved ongoing 'Make in India' agreement/program.

c) the bidder furnishes along with the bid a legally enforceable undertaking jointly executed by himself and such foreign Manufacturer for satisfactory manufacture, Supply (and erection, commissioning if applicable) and performance of 'The Product' offered including all warranty obligations as per the general and special conditions of contract.

B) Participation of Authorised Representative in the tender

(i) Bids of bidders quoting as authorised representative of a principal manufacturer would also be considered to be qualified, provided:

a) their principal manufacturer meets all the above pre-qualification criteria without exemption, and

b) the principal manufacturer furnishes a legally enforceable tender specific authorisation in the prescribed form (Section XIV of Tender document) assuring full guarantee and warranty obligations as per the general and special conditions of contract; and

c) the bidder himself should have been associated, as authorised representative of the same or other Principal Manufacturer for same set of services as in present bid (supply, installation, satisfactorily commissioning, after sales service as the case may be) for same or similar 'Product' for past three years ending on **31/03/2023.**

d) Either the Principal Manufacturer or its authorised representative can bid but both cannot bid simultaneously in the same tender.

e) One Principal Manufacturer can authorise only one representative for a particular tender. Similarly, one authorised representative can represent only one Principal Manufacturer in a particular tender.

f) For commercially-off-the-shelf (COTS) items with clear and standard specifications, a valid dealership certificate will have to be submitted.

C) Special Case for Existing Successful Past Contractors: In case the bidder who is a successful past contractor of BRBNMPL of the similar works in at least one of the recent past three procurements, who do not meet any or more of the pre-qualification criteria, would also be considered to be qualified in view of their proven credentials, for the work done by him in such recent past. The bidder has to provide successful completion certificate.

6. Financial Support from Holding Company: Where financial standing of the Bidder Firm is not strong enough to meet the qualifying criteria, it may rely on the financial standing credentials of its Holding Company for qualifying in the same. However, the bidder firm is required to qualify in all other criteria like experience & past performance and capacity/capability as specified in the tender on its own.

(i) If a bidder firm has taken the support of its Holding Company for participating in the tender, the Holding Company shall give its support by way of Bank Guarantee to cover the obligations of the Bidder under the Tender in case of any defaults.

(ii) The Financial Standing Credentials of a Holding Company can be clubbed with **only one** of the fully owned subsidiary bidding company, with appropriate legal documents proving such ownership.

(iii) Credentials of the partners of Joint ventures cannot **(repeat cannot)** be clubbed for the purpose of compliance of PQC in supply of Goods/Equipment, and each partner must comply with all the PQC criteria independently.

(iv) To avail Financial Support of the Holding Company, an Undertaking is to be submitted from the Holding Company on their letterhead as per the format given at **Annexure 13.**

(v) The amount of Bank Guarantee by Holding Company shall be equal to the amount of Bank Guarantee prescribed in the tender for the bidders. This guarantee will be in addition to the one to be submitted by the bidders.

Section X: Tender Form (Covering Letter)

(To be submitted as part of Technical bid, along with supporting documents, if any)
(on Bidder's Letter-head)

Date .....

To
The Chief General Manager
Bharatiya Reserve Bank Note Mudran (P) Limited
Corporate Office
Bengaluru - 560029

Ref: Your Tender Enquiry No: निविदा सं. **008/CO/OT/2023-24** दिनांक **February 29, 2024 / Tender No: 008/CO/OT/2023-24 dated February 29, 2024 for the work of Renovation of Corporate Office Building at BRBNMPL, Bengaluru**

Sir,

Having examined the above-mentioned Tender Document, we, the undersigned, hereby submit/upload our Techno-commercial and Financial bid (Price Schedule) for the procurement of Works in conformity with the said Tender Documents.

(Please tick appropriate boxes or strike out sentences/phrases not applicable to you)

1. Our Credentials

We are submitting this bid: -

- ☐ on our behalf, and there are no authorized representatives involved in this tender

Or

- ☐ as authorized representative offering goods manufactured by our Principal / OEM *(Manufacturer's Authorization Form enclosed)*

Or

- ☐ as authorized dealer/distributor/stockist offering goods manufactured by our Principal / OEM *(Dealership certificate enclosed)*

2. Our Eligibility and Qualifications to participate

We comply with all the eligibility criteria stipulated in this Tender Document, and the relevant declarations are made along with documents in Section-XVIII of this bid-form. We fully meet the qualification criteria stipulated in this Tender Document, and the relevant details are submitted along with documents.

3. Our Bid to perform the Works

We offer to ~~supply the subject Goods/Services~~ perform the works of requisite quality & workmanship and within ~~Delivery~~ Time Schedules in conformity with the Tender Document.

4. Prices

We hereby offer to ~~supply the goods/~~perform the works at our lowest prices and rates mentioned in the separately uploaded Price-Schedule. It is hereby confirmed that the prices quoted therein by us are:

(i) based on ~~terms of delivery and delivery schedule~~ time schedule confirmed by us;

and

(ii) Cost break-up of the quoted cost, showing inter-alia costs (including taxes and duties thereon) of all the included incidental Works/Services considered necessary to make the proposal self-contained and complete, has been indicated therein, and

(iii) based on the terms and mode of payment as stipulated in the Tender Document. We have understood that if we quote any deviation to terms and mode of payment, our bid is liable to be rejected as non-responsive, and

(iv) have been arrived at independently, without restricting competition, any consultation, communication, or agreement with any other bidder or competitor relating to:

a) those prices; or

b) the intention to submit an offer; or

c) the methods or factors used to calculate the prices offered.

(v) have neither been nor shall be knowingly disclosed by us, directly or indirectly, to any other bidder or competitor before bid opening or contract award unless otherwise required by law.

5. Affirmation to terms and conditions of the Tender Document:

We have understood the complete terms and conditions of the Tender Document. We accept and comply with these terms and conditions without reservations.

6. Abiding by the Bid Validity

We agree to keep our bid valid for acceptance for a period up to **120 Days,** as required in the Tender Document or for a subsequently extended period, if any, agreed to by us and are aware of penalties in this regard stipulated in the Tender Document in case we fail to do so.

7. Non-tampering of Downloaded Tender Document and Uploaded Scanned Copies (in case of eProcurement)

We confirm that in case of downloaded Tender Document, we have not changed/ edited its contents. We realise that in case any such change is noticed at any stage including after the award of contract, we would be liable to action under clause 44 of the GIT.

8. A Binding Contract

We further confirm that, if our bid is accepted, all such terms and conditions shall continue to be acceptable and applicable to the resultant contract, even though some of these documents may not be included in the contract Documents submitted by us. We do hereby undertake that, until a formal contract is signed or issued, this bid, together with your written Letter of Intent (LoI), shall constitute a binding contract between us.

9. Performance Guarantee and Signing the contract

We further confirm that, if our bid is accepted, we shall provide you with performance security of the required amount stipulated in the Tender Document for the due performance of the contract. We are fully aware that in the event of our failure to deposit the required security amount and/or failure to execute the agreement, the Procuring Entity has the right to avail any or all punitive actions laid down in this regard, stipulated in the Tender Document.

10. Signatories

We confirm that we are duly authorized to submit this bid and make commitments on behalf of the Bidder. Supporting documents are submitted herewith. We acknowledge that our digital/digitized signature is valid and legally binding (in case of eProcurement).

11. Rights of the Procuring Entity to Reject bid(s)

We further understand that you are not bound to accept the lowest or any bid you may receive against your above-referred Tender Document.

.....
(Signature with date)

.....
(Name and designation)

Duly authorized to sign bid for and on behalf of
M/s .....

[name & address of Bidder and seal of company]

अनुभाग / **Section XI:** कीमत अनुसूची / **Price Schedule**

Proforma of Price Bid cum for Renovation of Corporate Office Building at BRBNMPL, Bengaluru
(NON-SPLITABLE)

MSTC eTender No:
BRBNMPL/Corporate Office/Technical/2/23-24/ET/64[Renovation works of building]

From:

To
The Chief General Manager
Bharatiya Reserve Bank Note Mudran (P) Limited
Corporate Office
Bengaluru - 560029

प्रिय महोदय / Dear Sir,

SUB: Tender Notice for Renovation of Corporate Office Building at BRBNMPL, Bengaluru

संदर्भ / **REF:** आपकी निविदा सं। / Your Tender Enquiry No: 008/CO/OT/2023-24 dated February 29, 2024

We received your tender enquiry cited and we are pleased to submit the following as our price bid for your kind consideration.

Bill of quantities and scope of work:

BoQ Item Sl. No.	Item Specification	UoM (Unit of Measurement)	Quantity	Quoted Unit Rate (excluding GST) in Rs.	Amount in Rs.
1	2	3	4	5	6=4*5
Part A	**Civil Works**				
1	Demolishing R.C.C. work manually/ by mechanical means including stacking of steel bars and disposal of unserviceable material to the appropriate disposal area as per direction of Engineer-in-charge.	m3	18.00		
2	Extra for cutting reinforcement bars manually/ by mechanical means in R.C.C. or R.B. work (Payment shall be made on the cross sectional area of R.C.C. or R.B. work) as per direction of Engineer-in-charge.	m3	17.00		
3	Extra for scrapping, cleaning and straightening reinforcement from R.C.C. or R.B. work.	m3	17.00		
4	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material to the appropriate disposal area as per direction of Engineer-in-charge.	m3	120.00		
5	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material to the appropriate disposal area as per direction of Engineer-in-charge. In cement mortar (In solid thickness more than 200mm)	m3	12.00		
6	Dismantling doors, windows and clerestory windows (steel or wood) shutter including chowkhats, architrave, holdfasts etc. complete and	m2	239.00		

Price Schedule / Bid to be uploaded ONLINE In MSTC

	stacking to the appropriate disposal area as per direction of Engineer in-charge. Of area 3 m² and below				
BoQ Item Sl. No.	**Item Specification**	**UoM (Unit of Measurement)**	**Quantity**	**Quoted Unit Rate (excluding GST) in Rs.**	**Amount in Rs.**
7	Dismantling tile work in floors and roofs laid in cement mortar including stacking material to the appropriate disposal area as per direction of Engineer-in-charge. For thickness of tiles 10 mm to 25 mm	m2	1,025.00		
8	Dismantling old plaster or skirting raking out joints and cleaning the surface for plaster including disposal of rubbish to the dumping ground to the appropriate disposal area as per direction of Engineer-in-charge.	m2	118.00		
9	Dismantling aluminium/ Gypsum partitions, doors, windows, fixed glazing and false ceiling including disposal of unserviceable material and stacking of serviceable material to the appropriate disposal area as per direction of Engineer-in-charge.	m2	598.00		
10	Dismantling aluminium/ Gypsum partitions, doors, windows, fixed glazing and false ceiling including disposal of unserviceable material and stacking of serviceable material to the appropriate disposal area as per direction of Engineer-in-charge. (Structural glazing	m2	340.00		
11	Making the opening in brick/block masonry for door/window/clerestory window including dismantling in floor or walls by cutting masonry and making good the damages to walls, flooring and jambs complete, to match existing surface i/c disposal of mulba/ rubbish to the nearest municipal dumping ground, all complete as per direction of Engineer-in-Charge.	m2	12.00		
12	Earth work excavation by manual means for drains,canals, waste weir draft, approach channels, key trench, foundation of Bridges and such similar works, as per drawing and technical specifications, including setting out, shoring, strutting, barricading, caution lights, excavated surface leveled and sides neatly dressed disposing off or leveling the excavated stuff or sorting & stacking the selected stuff for reuse in a radius of 50 m and lift upto 1.5 m including cost of labour, tools, usage & other appurtenances required to complete the work. In ordinary/soft rock without blasting upto 1.5 m depth Note: Cost of De-watering upto 5 % may be added , where required assessment for dewatering shall be made as per site condition	m³	23.00		
13	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations and other similar works etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	m³	21.00		
14	Providing and injecting chemical emulsion for Pre-constructional Anti-Termite Treatment, creating continuous chemical barrier under and around the column pits, walls, trenches, basement excavation, top surface of the plinth filling, junction of wall and floor, along the external perimeter of building, expansion joints, over the top surface of consolidated earth on which apron is to be laid, surrounding of pipes and conduits with Chlorpyriphos 20% E.C. / Lindane 20% E.C. @ 3.19 l/m2 including cost of chemical, diluting in water to one percent concentration, labour, usage charges of machinery, complete as per specifications.	m2	38.00		
15	Providing and laying in position plain cement concrete for levelling course for all works in foundation. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed, laid in layers not exceeding 150 mm thickness, well compacted using plate vibrators, including all lead & lifts, cost of all materials of quality, labour, Usage charges of machineries, curing, and all the other appurtenances required to complete the work as per technical specifications. (The cost of steel reinforcement & formwork	m³	6.00		

Price Schedule / Bid to be uploaded ONLINE In MSTC

	shall be paid separately) Mix 1:4:8(M5) Using 40 mm nominal size graded crushed coarse aggregates				
BoQ Item Sl. No.	**Item Specification**	**UoM (Unit of Measure ment)**	**Quantity**	**Quoted Unit Rate (excluding GST) in Rs.**	**Amount in Rs.**
16	Providing and laying in position Reinforced cement concrete for all Foundation works. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticizers laid in finished layers, well compacted using needle vibrators, including all lead & lifts, cost of all materials, quality confirming to the requirements of relevant IS codes , labour, Usage charges of machinery, curing and all the other appurtenances required to complete the work as per technical specifications. (The cost of steel reinforcement & formwork to be paid separately) M25 Design Mix Using 20 mm and down size graded crushed coarse aggregates Foundation works;				
a	**Ground Floor - R wal raft and First Floor**	m^3	5.00		
b	**Column below ground / R wall / Plitth beam; Ground Floor and First Floor**	m^3	4.00		
c	**Column below ground / R wall; Ground Floor and First Floor**	m^3	20.00		
17	Providing and laying in Reinforced cement concrete for all Basement & surface level works, return walls, retaining walls, sunken floors etc. The granite/trap/basalt crushed graded coarse aggregates and fine aggregates as per relevant IS Codes machine mixed with super plasticisers, laid in ayers, well compacted using needle vibrators, providing weep holes wherever necesary, including all lead & lifts, cost of all materials of quality, labour, Usage charges of machinery, curing and all other appurtenances required to complete the work as per technical specifications. (The cost of steel reinforcement & formwork to be paid separately) M25 Design Mix Using 20 mm nominal size graded crushed coarse aggregates **- Beams / Slabs**	m^3	19.00		
18	Providing Thermo-Mechanically Treated bars of grade Fe-500D or more Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position, binding and anchoring to adjacent members whereever necessary complete as per Design including cost of material, labour, usage charges complete as per specifications. (The laps and wastages shall not be measured separately)	kg	3,042.00		
19	Providing and laying Autoclaved Aerated Cement blocks masonry with 100 mm thick AAC blocks as per IS 2185 (Part III) in super structure above plinth level up to floor I level in cement mortar 1:4 (1 cement : 4 coarse sand) including cost of all materials, labour, scaffolding and usage charges of machinery & other incidental charges complete as per the direction of engineer incharge of work.	m3	20.00		
20	Providing and laying autoclaved aerated cement blocks masonry with 150mm/230mm/300 mm thick AAC blocks as per IS 2185 (Part III) in super structure above plinth level up to floor I level with RCC band at sill level and lintel level with approved block laying polymer modified adhesive mortar including cost of all materials, labour, scaffolding and usage charges of machinery & other incidental charges complete as per the direction of engineer incharge of work.	m3	71.00		
21	Providing 20 mm cement plaster of mix :1:4 (1 cement: 4 fine sand) to brick/stone masonary including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge	m2	980.00		
22	Providing 12 mm cement plaster with Cement mortar 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement to brick masonry including rounding off corners wherever required smooth rendering, providing and removing scaffolding, including cost of materials, labour, curing complete as per specifications and as per directions of Engineer-in-charge	m2	243.00		

Price Schedule / Bid to be uploaded ONLINE In MSTC

BoQ Item Sl. No.	Item Specification	UoM (Unit of Measurement)	Quantity	Quoted Unit Rate (excluding GST) in Rs.	Amount in Rs.
23	Repairs to plaster in patches of 2.5 m2 and less in walls, ceilings 10 to 20mm thick in cement mortar 1:4 including cutting the patches in proper shape and replastering the surface of the wall including disposal of rubbish with a lead of 50m including curing cost of materials, labour, complete as per specification.	m2	83.00		
24	Providing and fixing double glazed hermetically sealed glazing in aluminium windows, ventilators and partition etc. with 6 mm thick clear float glass both side, having 12 mm air gap, including providing EPDM gasket, perforated aluminium spacers, desiccants, sealant (Both primary and secondary sealant) etc. as per specifications, drawings and direction of Engineer-in-charge complete including cost of materials, labour, usage charges of machinery complete as per specifications and as per directions of the Engineer-in-Charge.	m2	183.00		
25	Providing and laying Vitrified tiles in floor with different sizes (thickness to be specified by the manufacturer), with water absorption less than 0.08% and conforming to IS:15622, of approved brand & manufacturer, in all colours and shade, laid with cement based high polymer modified quick set tile adhesive (water based) conforming to IS : 15477, in average 6 mm thickness, including grouting of joints (Payment for grouting of joints to be made separately). Size of Tile 600x600 mm	m2	1,629.00		
26	Providing and laying Vitrified tiles in floor with different sizes (thickness to be specified by the manufacturer), with water absorption less than 0.08% and conforming to IS:15622, of approved brand & manufacturer, in all colours and shade, laid with cement based high polymer modified quick set tile adhesive (water based) conforming to IS : 15477, in average 6 mm thickness, including grouting of joints (Payment for grouting of joints to be made separately). Size of Tile 1000x1000 mm	m2	141.00		
27	Providing and laying Polished 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 Black, Cherry Red, Brown, Cat Eye, River Pink or equivalent.	m2	103.00		
28	Providing and fixing precoated galvanised iron profile sheets (size, shape and pitch of corrugation as approved by Engineer-in-charge) 0.50 mm (+ 0.05 %) total coated thickness with zinc coating 120 grams per m2 as per IS: 277, in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 microns. Sheet should have protective guard film of 25 microns minimum to avoid scratches during transportation and should be supplied in single length upto 12 m or as desired by Engineer-in-charge. The sheet shall be fixed using self drilling/self tapping screws of size (5.5x 55 mm) with EPDM seal, complete upto any pitch in horizontal/ vertical or curved surfaces, excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required. (Supplying and installing in position METAL DECKING sheet in 52mm depth profiles with thickness 1.25mm. and a decking profile of 52/271 (having 52mm depth x 845mm width) on HR Steel as per IS:1079 /	m2	125.00		

Price Schedule / Bid to be uploaded ONLINE In MSTC

	Galvanized Steel (as per IS:277) Galvanized finish. The metal sheets to be fixed to the structural framework with the help of Thru-bolts with a minimum diameter of ½" and shall be hot-dipped galvanized or stainless steel. Silicon washers to be used on the top and bottom of the sheet while bolting. item includes all material, labour, tools & tackles, Scaffolding, cleaning etc complete.(approx weight - 12.92 kg / Sqm)			
29	Applying one coat of water thinnable cement primer of approved brand and manufacture on wall surface :Water thinnable cement primer to give an even shade after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge. Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete as per specifications and as per directions of Engineer in charge. Wall painting with premium acrylic emulsion paint of interior grade, having VOC (Volatile Organic Compound) content less than 50 grams/ litre of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour. Two coats as per specifications and as per directions of Engineer in charge. (New walls)	m2	565.00	
30	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete as per specifications and as per directions of Engineer in charge. Wall painting with premium acrylic emulsion paint of interior grade, having VOC (Volatile Organic Compound) content less than 50 grams/ litre of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour. Two coats as per specifications and as per directions of Engineer in charge. (Existing walls)	m2	1,877.00	
31	Finishing walls with 100% Premium acrylic emulsion paint having VOC less than 50 gm/litre and UV resistance as per IS 15489:2004, Alkali & fungal resistance, dirt resistance exterior paint of required shade (Company Depot Tinted) with silicon additives, New work (Two coats applied @ 1.43 litre/ 10 m². Over and including priming coat of exterior primer applied @ 0.90 litre/10 m² with paint of approved quality to give an even shade, after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge.	m2	100.00	
32	Finishing walls with textured exterior paint of required shade :New work (Two coats applied @ 3.28 ltr/10 m²) over and including priming coat of exterior primer applied @ 2.20kg/10 m² to give an even shade after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge.	m2	100.00	
33	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade :Two coats on new work after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter including preparing the surface even and sand paper smooth, cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge.	m2	26.00	
34	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete. Fixed to openings / wooden frames with rawl plugs screws etc.	kg	15.00	

Price Schedule / Bid to be uploaded ONLINE In MSTC

35	Providing and fixing Structural Steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete including cost of materials, labour, usage charges of machinery complete as per specifications and as per directions of the Engineer-in-Charge.	kg	2,933.00	
36	Providing and laying Ceramic glazed floor tiles of size 300x300 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 15622 of approved make in colours such as White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand), Jointing with grey cement slurry @ 3.3 kg/m2 including pointing the joints with white cement and matching pigment etc., complete.	m2	41.00	
37	Providing and laying Ceramic glazed floor tiles of size 300x300 mm (thickness to be specified by the manufacturer), of 1st quality conforming to IS : 15622, of approved make, in all colours, shades, except White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick bed of cement mortar 1:4 (1 Cement : 4 Coarse sand), jointing with grey cement slurry @ 3.3 kg/ m2 including pointing the joints with white cement and matching pigments etc., complete.	m2	244.00	
38	Providing and fixing 18 mm thick gang saw cut granite of any color and shade, mirror polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills, facias and similar locations of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch up, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels. Area of slab over 0.50 m2	m2	18.00	
39	Extra for providing opening of required size & shape for wash basin / kitchen sink in kitchen platform, vanity counter and similar location in Granite, including necessary holes for pillar taps etc. including moulding, rubbing and polishing of cut edges etc. complete.	m	14.00	
40	Providing and laying water proofing treatment to the Roof with PU based single component elastomeric pure polyurethane based coating on New terrace / Chajjas / Sunken portion of WC:Bathroom, cold applied PU waterproofing membrane that is highly elastic with elongation greater than 400% and tensile strength greater than 2MPa as per ASTM D412. The waterproofing membrane to be applied in 2coats @ 1.6kg per m2 to achieve final DFT (dry film thickness) of 1mm including prime coat of epoxy primer @150 g per m2 and protection with 120gsm Geo-textile over the waterproofing membrane. The finished cost to include surface preparation, making coving at Junction, Bore Packing, treatment of construction joints completely as per specification & with a 10 years warranty on product & work from certified manufacturers as per the direction of the Engineer In charge.	m2	110.00	
41	Providing and fixing factory made ISI marked steel glazed doors, windows and ventilators, side /top /centre hung, with beading and all members such as F7D,F4B, K11 B and K12 B etc. complete of standard rolled steel sections, joints mitred and flash butt welded and sash bars tenoned and riveted, including providing and fixing of hinges, pivots, including priming coat of approved steel primer, but excluding the cost of other fittings, complete all as per approved design, (sectional weight of only steel members shall be measured for payment). Fixing with 15x3 mm lugs 10 cm long embedded in cement concrete block 15x10x10 cm of C.C. 1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) including cost of materials, labour, usage charges of machinery complete as per specifications and as per directions of the Engineer-in-Charge.	Kg	606.00	
42	Providing Teak wood frames of doors, windows, clerestory windows, ventilators and other frames, wrought, framed or assembled including making plaster groves (excluding cost of cement concrete and side	m3	1.45	

Price Schedule / Bid to be uploaded ONLINE In MSTC

	clamps), but including cost of materials, labour, usage charges complete as per specifications.				
BoQ Item Sl. No.	**Item Specification**	**UoM (Unit of Measurement)**	**Quantity**	**Quoted Unit Rate (excluding GST) in Rs.**	**Amount in Rs.**
43	Providing honne wood frames of doors, windows, clerestory windows, ventilators and other frames, wrought, framed or assembled including making plaster groves (excluding cost of cement concrete and side clamps), but including cost of materials, labour, usage charges complete as per specifications.	m3	2.25		
44	Providing and fixing flush door shutter made out of solid core block board type, well seasoned , chemicaly treated hard wood battens and internal frame with minimum 45 mm wide wooden frame alround door shutters covered with cross bonded wooden sheets (core veneer) hot pressed and fastened on both sides of the door useing liquid phenol formaldehyde resin as per IS specifications 2202 (part-I) 1991. from manufacturer complete as per spcification. 35 mm thick one side Teak	m2	55.00		
45	Providing and fixing flush door shutter made out of solid core block board type, well seasoned , chemicaly treated hard wood battens and internal frame with minimum 45 mm wide wooden frame alround door shutters covered with cross bonded wooden sheets (core veneer) hot pressed and fastened on both sides of the door useing liquid phenol formaldehyde resin as per IS specifications 2202 (part-I) 1991. from manufacturer complete as per spcification. 35 mm thick both side Teak	m2	28.00		
46	Floor polishing on masonry or concrete floors with wax polish of approved brand and manufacture to give an even surface including preparing the surface after thoroughly brooming the surface to remove all dirt, dust, mortar drops and foreign matter , cost of materials, labour complete as per specifications and as per directions of Engineer-in-charge.	m2	105.00		
47	Providing and laying Polished Marble 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 over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with cement slurry and pointing including rubbing, curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge. Note : The items of Marbal shall be operated only on the prior approval of Chief Engineer.	m2	30.00		
48	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections / appropriate sections and other sections of approved make conforming to IS: 733 and IS:1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, paneling and dash fasteners to be paid for separately) :For shutters of doors, windows & ventilators including providing and fixing hinges/ pivots and making provision for fixing of fittings wherever required including the cost of EPDM rubber / neoprene gasket required (Fittings shall be paid for separately) Powder coated aluminium (minimum thickness of powder coating 50 micron) including cost of materials, labour, usage charges of machinery complete as per specifications.	kg	231.00		
49	Providing and fixing bright finished brass hanging type floor door stopper with necessary screws, etc. complete.	Nos.	56.00		

Price Schedule / Bid to be uploaded ONLINE In MSTC

50	Providing and fixing aluminium die cast body tubular type universal hydraulic door closer (having brand logo with ISI, IS : 3564, embossed on the body, door weight upto 35 kg and door width upto 700 mm), with necessary accessories and screws etc. complete.	Nos.	59.00		
BoQ Item Sl. No.	**Item Specification**	**UoM (Unit of Measurement)**	**Quantity**	**Quoted Unit Rate (excluding GST) in Rs.**	**Amount in Rs.**
51	Providing and fixing chromium plated brass 100 mm mortice latch and lock with 6 levers and a pair of lever handles of approved quality with necessary screws etc. complete.	Nos.	56.00		
52	Providing and fixing chromium plated brass handles of 100/125 mm with necessary screws etc. complete	Nos.	118.00		
53	Providing and fixing aluminium tower bolts, ISI marked, anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour or shade, with necessary screws etc. complete	Nos.	108.00		
54	Providing and fixing IS : 12817 marked stainless steel butt hinges with stainless steel screws etc. complete : 100x58x1.90mm	Nos.	188.00		
55	Providing and fixing double action hydraulic floor spring of approved brand 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 including cost of materials, labour, usage charges of machinery complete as per specifications.	each	49.00		
56	Providing and laying 52 mm thick cement concrete flooring with concrete hardener topping, under layer 40 mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) and top layer 12 mm thick cement hardener consisting of mix 1:2 (1 cement hardener mix : 2 graded stone aggregate 6 mm nominal size) by volume, hardening compound mixed @ 2 litre per 50 kg of cement or as per direction of Engineer incharge.	m2	91.00		
57	Disposal of building rubbish / malba / similar unserviceable, dismantled or waste materials by mechanical means, including loading, transporting, unloading to approved municipal dumping ground or as approved by Engineer-in-charge to the appropriate disposal area.	m3	36.00		
58	Under deck with Rock Wool Providing and fixing Rock wool 50mm resin bonded rock wool slab having density 48 kg/m3 for under deck insulation of roofing including necessary fasteners,GI wire & mesh etc., complete.	m2	119.00		
59	Dismantling steel work in built up sections in angles, tees, flats and channels including all gusset plates, bolts, nuts, cutting rivets, welding etc. including dismembering and stacking to the appropriate disposal area as per direction of Engineer-in-charge.	kg	2,995.00		
60	Providing and fixing plywood 4 mm thick, one side decorative veneer conforming to IS: 1328 (type-1), for plain lining / cladding with necessary screws, including priming coat on unexposed surface with : Decorative veneer facings of approved manufacture	m2	82.00		
61	Vertical perforated light weight clay bricks Jaali wall Providing and supplying Non load bearing bricks of size 200/150/100 mm thickness for infill masonry with excellent thermal and sound insulation with density 750-850kg/m3 and compressive strength > 7.0 N/ mm2 & water absorption not greater than 15% & U value 1.30 W/m2 K laid with Cement Mortar 1:6 conforming to Building envelope as per GRIHA certification etc complete.	m2	21.00		

Price Schedule / Bid to be uploaded ONLINE In MSTC

BoQ Item Sl. No.	Item Specification	UoM (Unit of Measurement)	Quantity	Quoted Unit Rate (excluding GST) in Rs.	Amount in Rs.
62	Providing and fixing double scaffolding system (cup lock type) on the exterior side of building/structure, upto 25 metre height, above ground level, including additional rows of scaffolding in stepped manner as per requirement of site, made with 40mm dia M.S. tube, placed 1.5 metre centre to centre, horizontal & vertical tubes joint with cup & lock system with M.S. Tubes, M.S. tube challis, M.S. clamps and staircase system in the scaffolding for working platform etc. and maintaining it in a serviceable condition for execution of work of cleaning and/ or pointing and/ or applying chemical and removing it thereafter. The scaffolding system shall be stiffened with bracings, runners, connecting with the building etc, wherever required, if feasible, for inspection of work at required locations with essential safety features for the workmen etc., complete as per directions and approval of Engineer-in-charge.	m2	400.00		
63	Providing and erecting 2.00 metre high temporary barricading at site; each panel of size 2.50mx2.00m made of 40x40x6mm angle iron or 50x50x3mm hollow MS tube posts/horizontal members/bracings covered with 1.63mm thick MS sheet. The sheet shall be fixed with 30x5mm MS flat by suitable welding/riveting. The panels shall be made so that gap of 50cm above the ground is available making overall height as 2.5m. MS channel ISLC 75 @ 5.70 kg/m, 50cm long shall be provided at the bottom having oval shaped holes of size 50x25mm at both ends with 50cm long MS angle 40x40x6mm bracing. Suitable arrangement shall be made to fix the barricading to avoid from overturning by providing 250mm long expansion fasteners at both ends. The work shall be executed as per drawing/direction of Engineer-in-Charge which includes writing and painting, arrangement for traffic diversion such as traffic signals during construction at site for day and night, glow lamps, reflective signs, marking, flags, caution tape as directed by the Engineer-in-Charge. The barricading provided shall be retained in position at site continuously i/c shifting of barricading from one location to another location as many times as required during the execution of the entire work till its completion. Rate include its maintenance for damages, painting, all incidentals, labour materials, equipments and works required to execute the job. The barricading shall not be removed without prior approval of Engineerin-Charge.	m2	125.00		
64	Providing and applying Nito bond for old and new concrete : Providing and Applying at the junction of slab and vertical offsets with Cement Mortar 1:4 and admixed with Nitobond SBR at dosage of 1L per 50 kg of Cement or as per site condition .	m2	12.00		
65	Removal of existing Railing of all heights and staking at a place designated.	M	31.00		
66	Removal of existing Al / GI louvers and staking at a place designated.	M	48.00		
67	Extra for toughening charges for al windows	m2	164.00		
68	Removal of existing Granite cill	m2	74.00		
69	Automatic sliding door Providing & fixing double leaf glazed door of size approximately, 1500x 2400 ht fabricated with 12mm thk Toughen glass on Sensor system of DORMA/ make, ESA200 Door all sides edge polished.Cost of the door to be inclusive of all required cutout, fittings ,Channel as per dwgs or instructions and necessary holes to be drilled in the glass as desired. Cost to include as per details.(sensor system to be inclusive as per instruction with all kinds of wiring and	m2	6.00		

Price Schedule / Bid to be uploaded ONLINE In MSTC

	instalation) 5 year warrenty Complete the work as per site conditions and instructions of Architect, engineer.				
BoQ Item Sl. No.	**Item Specification**	**UoM (Unit of Measurement)**	**Quantity**	**Quoted Unit Rate (excluding GST) in Rs.**	**Amount in Rs.**
70	Providing Arpitha mesh for wall and column junction providing & fixing in position expanded metal plaster mesh [Arpitha make] or equivalent minimum 6" wide strips at the junctions of R.C.C columns/ beams/slab with brick work or wherever necessary, properly fixed, abutting the wall surfaces so as to get the plaster in line and plumb, necessary staging, scaffolding and curing at all levels and elevations etc. complete as directed. Providing and applying Plastering of internal walls and ceiling with cement mortar 1:4, over the mesh before plastering.	m	225.00		
71	**EXTRUDED ALUMINIUM SKIRTING** Providing and fixing of 60/75mm height Aluminium skirting to existing wall / partition Providing and fixing aluminum skirting 75mm wide Black powdercoated Make Bottomline / parallel. Complete the work as per site conditions and instructions of Architect, to match the joints of flooring using aluminium / appoved modules as per manufacturer specification.	m	830.00		
72	FULL HEIGHT GLAZED PARTITION WITH ALUMINIUM FRAME WORK Providing, Fabricating and fixing Full height glazed partitions consisting of.Approved Make Glass Partition with 10mm Toughened glass from FFL upto 2400mm height **Supply & Installation of approved make Glass partition with a tested sound reduction property upto Rw 36dB** Supplying & Installing of Glazed Partition with Proprietary anodized aluminum partition system size of 50mm x 25mm approved slimline aluminium section using horizontal on top & as verticals, horizontals at bottom sections or equivalent as per details. The glazing to be formed out of 10mm thick toughened glass as per details. The glass to be butt jointed with 2 to 3 mm edge chamfer & edge polishing all around. The butt joint of the glass shall be sealed using 3M glass to glass joint tape. Glass panels for height upto 2400mm to be single piece as per location. **Finishes of all aluminium frame components : Black anodized / powder coated** **Special Provisions :** Contractor has to consider the cost of edge polish, chamfering of the glass & sealing the glass joints with transparent silicon sealant in his quoted rate. Necessary 12mm thk MDF board with duco paint finish to be consider to fix glass as detailed drawing , lan & ele points with covering the services openings above ceiling with foam based sealant as detailed . same to be included in the quoted rate. **Mode of Measurement : floor level to 2400mm height (Only Glass panel) to be considered for measurements.**	m2	216.00		
73	Providing and fixing 12 mm thick toughened glass door shutter of approved brand and manufacture, with approved make stiles / frame for glazed doors with automatic acoustical drop seal on doors including providing and fixing top & bottom pivot & double acting hydraulic floor spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge including Door handle, lock and stopper etc. cost of all materials, labour, usage charges of machinery complete as per specifications and as per directions of the Engineer-in-Charge.stiles / frame for glazed doors with automatic acoustical drop seal on doors	m2	75.00		

Price Schedule / Bid to be uploaded ONLINE In MSTC

74	Baffle ceiling Providing and fixing Aluminum Baffle ceiling system with timber finish, Baffle width of 25mm x 50mm height X 0.5 mm thick and gap between baffles to be 50mm c/c. The baffles shall be fixed to Carrier. The Carriers shall be suspended by means of 6mm threaded rod at 1200 mm c/c. Rate to include for acoustical Fleece of porous material of 2-3mmthk over 2mmthk MDF fixed to the aluminum baffle as per the Manufactures recommendation etc. complete as per the details shown in the drawing. Color to match pine wood finish. Contractor to furnish the sample for Architect's approval.	m2	72.00	
75	Wooden false ceiling Providing and fixing Laminated Ceiling pricing of necessary framework of well-seasoned Hard wood suspended from true ceiling and fixed with 12mm thick common ply as base and finished with 1mm laminate as per approval. The same shall be turned 75mm on sides. Provision for cove/surface lights will have to be kept.	m2	25.00	
76	Work stations L-Shaped Workstation (1500 mm x 1500 x 600 deep mm) Providing and fixing L- Shaped Workstation as per following specifications : a PARTITION Minimum 60-65 mm thk modular partition frame work made out of CRCA MS of grade D minimum thickness of 1.5 mm powder coated 50 microns frame work designed to carry out electrical power & computer wiring in 2 different race ways with a separation of at least 300mm between them including necessary slots. The frame work consists of minimum two vertical upright a top horizontal section, bottom section and intermediate sections (minimum 40 mm x 30 mm) The frame structure covering and Top trim / sidetrim made out of Aluminum with powder coating (50 microns). All Aluminum Horizontal and vertical sections are extruded from AA 6063 American standard alloy with 12 HRC hardness of Architectural grade (IS 10259:1982) of 18 gauge minimum. The thicknesses of extruded sections vary based on its design and its point load bearing design engineering. The skinning / panels / tiles to be of 9mm thk Prelaminated particle Board (Grade II & Type-II ,IS 12823: 1990; Reaffirmed 2005) till 1200mm height from the floor level for outside facia. Inside facia = fabric panel with soft board with minimum 9mm thickness above table top (450 mm height). 9mm thk Prelaminated particle board panel finished with 0.8mm thk laminate from floor level to top of table top (750 mm height). The edges to be capped (as per approved design and drawing) Aluminum end trim with powder coating. Cost to include that for provision of fixing switches & the necessary cut out for the same. The height of the partition to be 1200mm. As per drawing & direction complete with all standard fittings & fixtures, leveling screws etc. Cost to include the supporting system to partitions & walls such as brackets / fasteners / joining posts / aluminum race ways 2 nos / wire management cleats / runners etc. (Basic cost of fabric Rs. 300/- per running meter.) TABLE TOP Providing and installing 600mm deep Table top made of 25mm thk pre laminated particle board Grade II & Type-II (IS 12823: 1990; Reaffirmed 2005) finshed with 0.8 mm thk laminate, all exposed edges finished with 2mm x 25mm PVC hot pressed lipping of approved profile, all of approved shade and colour. Rates are inclusive of fixing to the partition with necessary powder coated heavy duty MS brackets, cleats etc. for supporting table tops and rates shall include that for 1 nos. matching to top, ABS wire manager (standard size) per work station, complete as per drawings & direction. Providing & Installing 480mm wide MS key board pull out tray with (180mmx180mm) provision to house mouse made out of MS with black matt finished powder coating with telescopic channel Providing & Installing quarter round (size 450x 600mm) 10mm thk intermediate toughened frosted glass divider with necessary fittings &	No	54.00	

Price Schedule / Bid to be uploaded ONLINE In MSTC

	hardware above table top. The edges of the glass to be machine polished as per drawing LEG PANEL/GABLE END Providing & Installing 600mm x 725mm Leg panels/gable ends made up of 25mm thick Prelaminated Particle Board (0.8 mm thk laminate on both sides). All edges to be lipped with minimum 2mm thick PVC edging. As per Drawing and design. At designated locations (RHS) every unit to be provided with a writing board consisting of 4mm tempered glass tile integrated into the partition framework. Glass tile to be provided with opaque white vinyl stickeirng on the inside surface			
77	Pedestals for work stations Providing and installing drawer boxes of size 585mm ht., 390mm width and 500mm deep, top made out of 25mm thk pre laminated particle board Grade II & Type-II (IS 12823: 1990; Reaffirmed 2005) finished with 0.8mm thk laminate, front and sides made of 25mm thk pre laminated particle board Grade II & Type-II (IS 12823: 1990; Reaffirmed 2005)finished in 0.8mm thk laminate and back, drawer bottom to be 6mm thk particle board with.08mm thk laminate. 2 nos. minimum 120mm high drawer & 1 minimum 275mm high filing drawer with 4 nos. Nylon Spacers 10mm ht. with single key lock mechanism / SS telescopic channels and provided with handle and necessary fixtures (heavy duty high performance) as directed.	No	54.00	
78	Meeting table Meeting Room Table 4500 x 1500 x 750mm (H) Made out of superior quality Plywood finish with 4mm thick veneered to all expose area with Teak wood beading / molding all around including provision for Pop up box (for IT and Electrical) external internal finish with melamine polished complete in all respect.	No	5.00	
79	Providing and laying Gypsum panel partitions 100 mm thick with water proof Gypsum panels of size 666x500x100 mm, made of calcite phosphor Gypsum fixed with tongue and groove, jointed with bonding plaster as per manufacturer's specifications in superstructure above plinth level up to floor I level. Gypsum blocks will have a minimum compressive strength of 9.3 kg/cm2 including cost of all materials, labour, scaffolding and usage charges of machinery & other incidental charges complete as per the direction of engineer incharge of work.	m2	64.00	
80	Providing & Fixing of Mineral Fibre Acoustical Suspended Ceiling System in module size of 600 x 600 x 16mm with Exposed Grid for Hospitals, Shopping malls, Commercial establishments and office complexes. The tiles should have Humidity Resistance (RH) of 99%, NRC 0.5, Light Reflectance <o87%, Thermal Conductivity k = 0.052 - 0.057 w/m K, Colour White, Fire Performance UK Class 0 I Class 1 (BS 476 pt- 6 &7) and suitable for Green Building application with Recycled content of 30%. The tile shall be laid on 24 mm wide T - section flanges colour white having rotary stitching on all T sections i.e. the Main Runner, 1200 mm & 600 mm Cross Tees with a web height of 38mm and a load carrying capacity of 15 kg/m2 &pull out strength of minimum 100 kg The T Sections should have a Galvanizing of 90 grams per m2 and need to be installed with Suspension system.	m2	1,564.00	
81	Providing and fixing false ceiling at all height including providing and fixing of frame work made of special sections, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/m2 (both side inclusive) as per IS : 277 and consisting of angle cleats of size 25 mm wide x 1.6 mm thick with flanges of 27 mm and 37mm, at 1200 mm centre to centre, one flange fixed to the ceiling with dash fastener 12.5 mm dia x 50mm long with 6mm dia bolts, other flange of cleat fixed to the angle hangers of 25x10x0.50 mm of required length with nuts & bolts of required size and other end of angle hanger fixed with intermediate G.I. channels 45x15x0.9 mm running at the spacing of 1200 mm centre to centre, to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having lips of 10.5 mm, at 450 mm centre to centre, shall be fixed in a direction perpendicular to G.I. intermediate channel with connecting clips made	m2	356.00	

Price Schedule / Bid to be uploaded ONLINE In MSTC

	out of 2.64 mm dia x 230 mm long G.I. wire at every junction, including fixing perimeter channels 0.5 mm thick 27 mm high having flanges of 20 mm and 30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm centre, with 25mm long dry wall screws @ 230 mm interval, including fixing of gypsum board to ceiling section and perimeter channel with the help of dry wall screws of size 3.5 x 25 mm at 230 mm c/c, including jointing and finishing to a flush finish of tapered and square edges of the board with recommended jointing compound , jointing tapes , finishing with jointing compound in 3 layers covering upto 150 mm on both sides of joint and two coats of primer suitable for board, all as per manufacturer's specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed, all complete as per drawings, specification and direction of the Engineer in Charge but excluding the cost of painting with : 12.5 mm thick tapered edge gypsum plain board conforming to IS: 2095- (Part I) : 2011 (Board with BIS Certification marks only)			Price Schedule / Bid to be uploaded ONLINE In MSTC	
82	Providing and fixing Semi - Unitized structrual Glazing system with DGU vision panel and with or without Openable/top hung system which permits necessary thermal expansion and contraction and to suit wind load 200kg per Sqm, using Aluminium extruded built to standard tubular section of approved make JINDAL / Equivalent Polyster powder coated (Minimum thickness of powder coating 50 - 60 micron) fixed with necessary aluminium cleats with slots for adjusting plumb with suitable standard expansion fateners, with specified glass of 6mm SKN 165 heat strengthened glass on outer face, 12mm air gap and 6mm clear heat strengthened glass inside (, structrual selant: spacer setting block, back foam rod, Non staining weather sealant; Non staining perimeter sealant and splice joint etc. complete as per the drawing and direction of Architect - in - Charge. Frame: Aluminium extrude profile of 81mm x 67mm Mullion, 81mm x 38.5mm End Mullion, 67mm x 56mm Transom , 68mm x 28mm Double glass subframe, 29mm x 6.5mm holding cleat Structural sealant: Dowcorning / Equivalent. Non - stining weather grade silicon sealant	m2	352.00		
83	Extra for poviding and fixing of top hung shutter in structural glazing over the above rate using SS friction hinges, single point locking cum handle etc. Top Hung shutter of size: 1200 x 1150mm (1sh)	m2	37.00		
	Sub-total A: Civil Works				

BoQ Item Sl. No.	Item Specification	UoM (Unit of Measure ment)	Quantity	Quoted Unit Rate (excluding GST) in Rs.	Amount in Rs.
Part B	**Electrical Works**				
	Electric Electrical Works: Open Conduit System				
1	Supplying heavy gauge PVC conduit pipe ..... dia mm ..... thick confirming to IS 2509 with suitable size bends, junction boxes, adhesive paste etc , and fixing using inverted wood plugs in case of RCC ceiling and ceiling / stone structure or rawl plugs in case of brick walls and cement plastering the damaged portion using heavy gauge saddles at an interval of 700mm using NF screws.				
a	19/20mm dia 2mm thick	Mtr	4,180.00	ONLINE	
b	25mm dia 2mm thick	Mtr	2,380.00		
2	Supplying heavy gauge PVC Conduit Pipe ….dia .....mm thick with suitable size bends, metal junction boxes adhesive paste etc., by groove cutting in the wall and fixing by bracing U or J hooks and cement plastering up to the wall surface and run with 18 SWG GI fish wire run throughout the conduit wherever necessary.				
a	19/20mm dia 2mm thick	Mtr	740.00	ONLINE	
b	25mm dia 2mm thick	Mtr	865.00		

BoQ Item Sl. No.	Item Specification	UoM (Unit of Measurement)	Quantity	Quoted Unit Rate (excluding GST) in Rs.	Amount in Rs.
3	Supplying and fixing PVC/metal conduit Deep junction box				
a	19/20mm deep Junction box	Each	370.00		
b	25mm deep Junction box	Each	190.00		
c	32mm deep Junction box	Each			
4	Extra for Groove cutting in brick wall/CC floor to the suitable depth for concealing of Conduit/GI pipe and plastering, finishing upto wall surface complete.				
a	upto 50mm conduit in brick wall	Mtr	65.00		
b	upto 50mm conduit in CC floor	Mtr	20.00		
5	Supplying PVC/GI flexible conduit pipe…mm dia fixing on surface over inverted tapered wooden plugs or phill plugs or rawl plugs and clamped using heavy gauge saddles at an interval of 300mm using NF screws and on either end of the pipe terminated completely				
a	20mm	Mtr	100.00		
b	25mm	Mtr	95.00		
	Point wiring using Copper wire with switch.				
6	Supplying and wiring adopting loop system in existing PVC Conduit /casing capping using 2x1.5Sqmm (Phase & Neutral) & 1x1.0 sqmm (Earth wire) FRLS multi strand PVC insulated copper wire (confirming to IS-694: and latest amendments) with a 6Amps flush type SP control switch shall be fixed on the existing plastic sheet/ gang box, the other end of the wires shall be terminated with sufficient loose length in a wood/PVC round block. complete for each outlet.				
a	Short point upto 3Mtr from tapping point to out let via switch	EA	144.00		
b	Medium point above 3Mtr upto 6Mtr from tapping point to out let via switch	EA	159.00		
c	Long point above 6Mtr upto 10Mtr from tapping point to out let via switch	EA	89.00		
	Point wiring using Copper wire without switch.				
7	Wiring for lighting/power circuit using one of FRLS PVC insulated 1100V grade, multistrand copper wire with low conductor resistance single core in open or concealed system of wiring with specified IS-694:confirming to latest amendments.				
a	1.5 sqmm	Mtr	3,690.00		
b	2.5 sqmm	Mtr	10,335.00		
c	4 sqmm	Mtr	14,200.00		
	The following additional tests are compulsory either to be conducted at works or independent lab with witness by inspecting authority. Additional Tests for FRLS-Applicable Standard Oxygen Index -IS 694-1990, Clause 16.8 Smoke Density -IS 694-1990, Clause 16.14 Test for Halogen Acid Gas evaluation -IS 694-1990, Clause 16.12				
8	Supplying and flush mounting powder coated / galvanized metal box suitable for mounting modular switch plates. The box should be firmly flush mounted after due groove cutting in Brick/Stone/C.C wall.				
a	1-3Way	Each	315.00		
b	4-5Way	Each	60.00		
c	6 Way	Each	10.00		
d	8 Way	Each	110.00		
e	10-12 Way	Each	4.00		
f	16-18 Way	Each	1.00		

Price Schedule / Bid to be uploaded ONLINE In MSTC

Price Schedule / Bid to be uploaded ONLINE In MSTC

BoQ Item Sl. No.	Item Specification	UoM (Unit of Measure ment)	Quantity	Quoted Unit Rate (excluding GST) in Rs.	Amount in Rs.
9	Supplying and fixing superior quality modular switch mounting polycarbonate plate with necessary supporting back plate with required nos. of machine screws, bolts nuts etc., complete on the existing metal/PVC box.				
a	1 to 3 Module	Each	315.00		
b	4 Module	Each	60.00		
c	6 Module	Each	10.00		
d	8 Module	Each	110.00		
e	10-12 Module	Each	4.00		
f	16-18 Module	Each	3.00		
10	Supplying and fixing of modular switch & connected accessories on existing modular switch plate as per IS 3854 and IS 1293.				
a	6 Amps one way Switch	Each	410.00		
b	6 Amps 2 way Switch	Each	3.00		
c	6Amps 3way socket	Each	255.00		
d	16Amps one way switch	Each	91.00		
e	6/16Amps universal socket	Each	67.00		
f	TV/Telephone socket	Each	70.00		
g	RJ45/I.o.Outlet Cat-6	Each	30.00		
11	Extra for supplying 4mm thick white plastic plate and covering for junction boxes of size ……mm conduit using necessary machine screws.				
a	80mm	Each	10.00		
b	110mm	Each	5.00		
12	Supplying and fixing of metal clad industrial plugs and sockets. 2pole+earth 250V PLUG				
a	10 Amps	Each	4.00		
b	20 Amps	Each	4.00		
13	3pole+earth 440V PLUG				
a	20 Amps	Each	4.00		
b	30 Amps	Each	4.00		
14	Supplying and fixing miniature circuit breakers on existing MCB distribution boards using necessary fixing materials and 'C' Type curve, indicator ON/OFF, energy cross-3 with Short circuit breaking capacity of 10K and complete wiring as required confirming to IEC 60898.				
a	6-32Amps SP	Each	36.00		
b	6-32 Amps DP	Each	6.00		
c	6-32Amps TPN	Each	1.00		
d	40 Amps TPN	Each	2.00		
e	50-63Amps TPN	Each	2.00		
15	Supplying and fixing regular MCB distribution boards on wall / wood board / flush mounting using required clamps, bolts, nuts etc., with provision for fixing suitable type capacity MCB's single phase / 3 phase / single door with powder coated painting. Made out of 14 SWG MS enclosure.				

Price Schedule / Bid to be uploaded ONLINE In MSTC

BoQ Item Sl. No.	Item Specification	UoM (Unit of Measure ment)	Quantity	Quoted Unit Rate (excluding GST) in Rs.	Amount in Rs.
	III - Double Door				
a	8Way TP &N	Each	1.00		
16	Supplying, fixing and wiring Residual current circuit breaker (RCCB) 240/450V up to 300mA sensitivity on existing wood/ panel board.				
a	16A-25A 2 pole	Each	2.00		
17	Supply, Installation & Commissioning of lighting control automation - Wired PIR Motion Sensor • PI R sensors shall be deployed for on demand lighting/ electric requirement • PI R sensor directly activates/ deactivates the end devices which are all wired together	Each	4.00		
	FANS & AIR CONDITIONERS				
18	Supplying exhaust fan of 1440 RPM of 300 mm (12") size with bracket blades complete for light duty suitable to operate on 230V 50Hz, AC Supply.	Each	5.00		
	NETWORKING & TELECOMUNICATION				
19	DATA CABLING : Supplying and drawing UTP-CAT 6E LAN cable.	M	4,650.00		
20	**Telephone CABLING** : Supplying and drawing PVC flexible one pair telephone unarmoured tinned copper cable. 2 Pair	M	1,400.00		
21	TV CABLING : Supplying and drawing PVC insulated gas injected physical foam jelly flooded co-axial TV cable.RG-6.	M	400.00		
	Electrical Works				
22	Providing & Fixing MV Danger notice Plate of 200x150mm made of mild steel, at least 2mm thick & vitreous enameled white on borh sides, and with inscription in single Red color on front side as required.	Each	1.00		
23	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray (Galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
a	150 mm width X 50 mm depth X 1.6 mm thickness	Mtr	370.00		
b	300 mm width X 50 mm depth X 1.6 mm thickness	Mtr	60.00		
c	450 mm width X 50 mm depth X 2.0 mm thickness	Mtr	50.00		
d	600 mm width X 50 mm depth X 2.0 mm thickness	Each	10.00		
24	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "bends" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
a	150 mm width X 50 mm depth X 1.6 mm thickness	Each	23.00		
b	300 mm width X 50 mm depth X 1.6 mm thickness	Each	8.00		
c	450 mm width X 50 mm depth X 2.0 mm thickness	Each	4.00		
d	600 mm width X 75 mm depth X 2.0 mm thickness	Each	2.00		
25	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Tee" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections,				

Price Schedule / Bid to be uploaded ONLINE In MSTC

	joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.			
a	150 mm width X 50 mm depth X 1.6 mm thickness	Each	5.00	
b	300 mm width X 50 mm depth X 1.6 mm thickness	Each	2.00	
c	450 mm width X 50 mm depth X 2.0 mm thickness	Each	1.00	
26	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Cross member"(galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc as required.			
a	150 mm width X 50 mm depth X 1.6 mm thickness	Each	2.00	
b	300 mm width X 50 mm depth X 1.6 mm thickness	Each	2.00	
c	450 mm width X 50 mm depth X 2.0 mm thickness	Each	1.00	
27	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Reducer" (galvanisation not less than 50 microns) with perforation not more than17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc as required.			
a	150 mm width X 50 mm depth X 1.6 mm thickness	Each	6.00	
b	300 mm width X 50 mm depth X 1.6 mm thickness	Each	3.00	
c	450 mm width X 50 mm depth X 2.0 mm thickness	Each	1.00	
28	Electrical Works**:LT PANEL BOARDS WORKS** Supplying, Installation,unloading,,storing ,shifting,Testing & commissioning of Form 4A compartment LT panels as per IEC-60439, suitable for 415V, 3 phase, 4 Wire 50 Hz AC supply system of suitable size fabricated in compartmentalized design, from CRCA sheet steel of 1.6 mm thickness for internal partition , 2mm thickness for frame work, body and covers, 3mm thickness for gland plates with stiffeners where ever required and shall be dust and vermin proof construction.All doors to have double rubber/foam gasket with shutter assembly & door seating frame.The Panel shall be fully as per the requirement of CEIG/Electrical Inspectorate/ EB authorities. The panel must be a vibration free structure which is chemically treated wth seven tank process before painting for surface treatment and powder coated with two coats of Zinc chromate primer and two coats of paint of approved shade or RAL 7032. Fire and corrosion resistant coating similar to VIPER FR-1101 applied in two coats with necessary primer. Busbars:Aluminium/ Copper busbars of Electrolytic grade conductivity as per standard IS 5082. Bus bar supports:Fire retardant DMC/FRP/SMC. Bus bar joints: Shrouded/Tinned. Aluminum bus bars shall be bare with color coding at the ends/Copper shall be bare with color coding at the ends/For Humidified areas the copper bus bars shall be coated with tin. The current density for Aluminium busbars shall be 0.8A/sq.mm and The current density for Copper busbars shall be 1.6A/sq.mm.Louvers shall be provided for all the bus bars chambers (Horizontal & Vertical) with mesh to meet IP Requirement. All vertical bus bars in bus bar alley shall have bottom supports. All UPS outgoing panels shall have neutral busbars double the size of phase & gland plates should be of alluminium.			

Price Schedule / Bid to be uploaded ONLINE In MSTC

BoQ Item Sl. No.	Item Specification	UoM (Unit of Measure ment)	Quantity	Quoted Unit Rate (excluding GST) in Rs.	Amount in Rs.
	All ACBs shall confirm IS 13947-1/IEC 947-1 for general rules & IS 13947 rules & IS 13947-2/IEC 947-2 for Circuit breakers. All protection releases for ACBs/ACBs shall be as per SLD. All MCCB/ACB's shall be Cat: A except ACB's for Ltg & raw power input distribution panel shall be with Cat: B . All ACB, MCCB's shall have 2EA. NO + 2EAof NC Auxiliary contacts. Auxilliary contactor to be provided along with auto-manual switch where ever required. All MCCB's shall have plug EAting from (70 -100%) for < 250A & (40 - 100%) for > 250A All Breakers both Incoming & Outgoing shall have LED 'ON / OFF / TRIP' indications without fail. CTs shall be of cast res /polycarbonate split core type only.All AC feeders will have time delays of 0-60 Seconds. All MCCBs of 250A and above for non-ups loads will be microprocessor based only and for UPS panels shall be with thermal releases. All MDMs to be of dual source meters unless otherwise specified. ics should be 100% icu for service voltage. Any other percentage shall not be accepted. The MCCBs of 250A and above shall have flag indication for tripping. (All the Incommer ACBs/MCCBs of LT Kiosk, main panel,HVAC panel, Utility panel , fire panel and Emergency power panel shall be compatable to be integerated with BMS(RS 485) and shall be provided with Remote operation, RS485 protocol and shall be able to remotely read and EAthe parameters for protection functions. Consult history files, maintenance indicators and control & monitoring the breakers. The ACBs shall be provided with making current release for self protection of the breaker in case of closing on fault current also shall have reverse power and phase sequence protection .including wiring for interconnections complete as required.)				
a	Service, Modification of existing panel work, Shifting to Installation Loacation, Testing & Commissioning of **MAIN LT PANEL (Indoor Type)** as directed by the Engineer-In-Charge of the work	EA	1.00		
b	Service, Modification, Testing & Commissioning of existing **Capacitor PANEL**, Complete All as directed by the Engineer-In-Charge of the work	EA	1.00		
	LT Cables & Terminations				
29	Supply, Testing and Commissioning of 1.1 kV grade 1C/3C/3.5C & 4C stranded XLPE(above 6 sq.mm)/Class A PVC insulated(below 6 sq.mm), FRLS Armoured Aluminum conductor cables conforming to IS:7098/ IS-1554 Part I (with latest amendments). Armouring strip thickness in average +5% and resistivity 14 Ohms/Kms (Max) as per IS-3975l. Cable identification labels at both ends clearly mentioning the cable specs & also at appropriate intervals along the cable route should be provided. **4 core 16 sqm**	Metre	70.00		
30	Supply and installing of **150 mm width x 40mm depth x 2 mm thick Pre Galvanized floor raceways** made out of 2 mm thick GI sheet steel with 2mm cover, with internal compartments complete with jointing sleeves, bends, Tee's, Covers and other accessories under floor installation including cutting and chasing the floor, making good the same, placing in position and cleaning from inside complete of following sizes etc. as required. etc as required. with all lead and Lifts and as directed by the Engineer-In-Charge of the work.	Metre	80.00		
31	Supply and installing of **225 mm width x 40mm depth x 2 mm thick Pre Galvanized floor raceways** made out of 2 mm thick GI sheet steel with 2mm cover, with internal compartments complete with jointing sleeves, bends, Tee's, Covers and other accessories under floor installation including cutting and chasing the floor, making good the same, placing in position and cleaning from inside complete of following sizes etc. as required. etc as required. with all lead and Lifts and as directed by the Engineer-In-Charge of the work.	Metre	50.00		

Price Schedule / Bid to be uploaded ONLINE In MSTC

BoQ Item Sl. No.	Item Specification	UoM (Unit of Measure ment)	Quantity	Quoted Unit Rate (excluding GST) in Rs.	Amount in Rs.
32	**Supply and laying** following sizes of GI/Copper Wire/strips including supply of fixing clamps and accessories when laid inside the building and inclusive of excavation & refilling of earth when laid outside the building and interconnections with earth pit and equipment, terminations/ interconnections in an approved manner as per IS:3043 (with latest amendments) inclusive of supply of all hardwares complete as required.GI conductor joints shall be bolted and joints shall be protected with bitumen paint.Copper conductor joint shall be brazed or rivetted .The equipment connection shall be bolted using galvanized hardware or bolted by using passivated hardware. **8 SWG GI Wire**	Metre	100.00		
33	**SAFETY EQUIPMENTS** Electrical insulating mats made of PVC Elastomer 3mm Thick & 1 mtr wide near swichboards, etc as per direction of Engineer In charge. Mat should conform to IS 15652 Class A - suitable for safe working voltage of upto 11 kV. Test certificate to be provided with supply. Mat's top Surface should be Antiskid Dotted & Bottom Surface should be Textured for Floor Grip. Mat's top Surface should be Antiskid Dotted & Bottom Surface should be Textured for Floor Grip. with all lead and Lifts and as directed by the Engineer-In-Charge of the work.	EA	5.00		
34	Supply and fixing of shock treatment chart in English, Hindi & local language framed in glass framework. with all lead and Lifts and as directed by the Engineer-In-Charge of the work.	EA	2.00		
35	Supply of Rubber hand gloves suitable for 1.1KV. with all lead and Lifts and as directed by the Engineer-In-Charge of the work.	EA	2.00		
36	Supply and providing St. John make first aid box 18SWG MS sheet duly painted as approved by Indian red cross society complete with all first aid medicines. with all lead and Lifts and as directed by the Engineer-In-Charge of the work.	EA	2.00		
37	Providing and fixing Danger Plate Danger Plates shall be provided on HV and MV equipments. MV danger notice plate shall be 200 mm x 150 mm made of mild steel at least 2 mm thick vitreous enameled white on both sides and with the descriptions in signal red colour on front side as required. Notice plates of other suitable materials such as stainless steel, brass or such other permanent nature material shall also be accepted with the description engraved in signal red colour. with all lead and Lifts and as directed by the Engineer-In-Charge of the work.	EA	2.00		
38	Supply and fixing of LAMINATED Single line diagram chart duly framed with 5mm thick glasssuitable to mount on wall. with all lead and Lifts and as directed by the Engineer-In-Charge of the work.	EA	1.00		
39	Supply & Fixing of MS sheet board of size 500mm x 300mm of 16 SWG with Entry Restricted To Authorised Persons Only near the Main entrance of the Substation. The lettering shall be Black painted on Yellow Back ground with all lead and Lifts and as directed by the Engineer-In-Charge of the work.	EA	3.00		
40	Supply, laying of **2Cx1.0 Sqmm Speaker wire**, approved make, including terminations/crimping at either ends in Existing PVC conduit.	Metre	3,800.00		
41	Supply and fixing of Bell push	Each	75.00		
42	Supply and fixing of Alarm panel at servent room	Each	1.00		
Sub-total B: Electrical Works					

Price Schedule / Bid to be uploaded ONLINE In MSTC

BoQ Item Sl. No.	Item Specification	UoM (Unit of Measure ment)	Quantity	Quoted Unit Rate (excluding GST) in Rs.	Amount in Rs.
C	**Plumbing and Sanitary Works**				
I	**Water Supply & Sanitary**				
1	Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete :				
a	20 mm nominal bore	Nos.	9.00		
b	25 mm nominal bore	Nos.	4.00		
c	32 mm nominal bore	Nos.	11.00		
d	40 mm nominal bore	Nos.	2.00		
e	50 mm nominal bore	Nos.	4.00		
2	Providing and fixing cast iron lever operated slim seal type butterfly valves of CI body and spheroidal graphite iron disc (SG iron),with nitrile rubber seal, tested to 10 kg / sq.cm Confirming to BS 5155 / MF6 standards and including a set of GI flanges as per BS-10 table 1 including bolt nuts, GI washers, and neoprene rubber gaskets Complete etc., (inter valve / audco make) on the suction & delivery side				
a	65 mm nominal bore	Nos.	2.00		
b	80 mm nominal bore	Nos.	6.00		
3	Providing and fixing unplasticised PVC connection pipe with brass unions :				
	45 cm length				
a	15 mm nominal bore	Nos.	22.00		
b	20 mm nominal bore	Nos.	1.00		
4	Providing and fixing PTMT extension nipple for water pipe, fittings of approved quality and colour.				
a	15 mm nominal bore, weighing not less than 32 g	Nos.	62.00		
b	20 mm nominal bore, weighing not less than 40 g	Nos.	1.00		
5	Providing and fixing of brass body nickel plated **automatic air release valves** with brass splindle, NBR(nitrile butadiene Rubber) and join franite elastomer, stainless steel spring polypropylenic float at the top most points of watersupply distribution risers in the shafts having pressure of 10kg/cm2. **20mm dia**	Nos.	2.00		
6	Supplying, installing, fixing, jointing, testing and commissioning of approved make Chlorinated Polyvinyl Chloride pipes (CPVC) SDR.11 of ASTM 2846 up to 50 mm dia,. The fittings and specials such as tees, elbows, couplers, bends, enlargers etc., with CPVC brass threaded combination / transition specials such as male adapters brass threaded female adapters, brass FPT Tee, Brass FPT elbow etc., where connection with metal is to be made including necessary drilling holes, chasing walls and making the same good in geru mixed cement mortar 1:1 restore the same original condition neatly as directed by the Engineer in charge. Joints to be made with CPVC solvent cement up to 50mm dia as per ASTM D2846 . with necessary supports (Concealed piping within toilets, Shaft verticals &				

Price Schedule / Bid to be uploaded ONLINE In MSTC

	diversions) .Supports to be painted with anti corrosive paints to avoid corrosion			
	Internal Toilet			
a	15mm (NB)	Rmt	25.00	
b	20mm (NB)	Rmt	212.00	
c	25mm (NB)	Rmt	25.00	
d	32mm (NB)	Rmt	195.00	
e	40mm (NB)	Rmt	50.00	
f	50mm (NB)	Rmt	150.00	
7	Supplying, installing, fixing, jointing, testing and commissioning of approved make Chlorinated Polyvinyl Chloride pipes (CPVC) SCH 40 as per ASTM F-441 . The fittings and specials such as tees, elbows, couplers, bends, enlargers etc., with CPVC brass threaded combination / transition specials such as male adapters brass threaded female adapters, brass FPT Tee, Brass FPT elbow etc., where connection with metal is to be made including necessary drilling holes, chasing walls and making the same good in geru mixed cement mortar 1:1 restore the same original condition neatly as directed by the Engineer in charge. Joints to be made with primer P70 for above 50mm dia confirming to ASTM F4931 / 724 with necessary supports .Supports to be painted with anti corrosive paints to avoid corrosion			
a	65mm (NB)	Rmt	155.00	
b	80mm (NB)	Rmt	60.00	
8	Supplying, fixing and testing **PVC soil, waste , vent** (SWR) confirming to IS13592 : 1990, type B with solvent joint inclusive of all necessary specials like multi floor traps (50mm water seal), bends 45 or 90 degree, 'Y's, tees, offsets, junctions, couplers screw type caps with rubber rings for cleanout pipe ends, etc., Running in the sunken slabs slabs/fixed on walls or on . All suspenders, saddles, pipe packs are to be quoted separately under relevant items.All including internal Toilet.All supports shall be painted with anti-corrosive paints to avoid corrosion.			
a	50mm dia	Rmt	46.00	
b	65mm dia	Rmt	7.00	
c	75 mm dia	Rmt	140.00	
d	110 mm dia	Rmt	100.00	
9	Supply and fixing **PVC Multi floor trap** with frame and cover (110 mm x 110 mm square)P trap of 75mm with boss connection which is watersealed. Outlet fixed on a bed of cement concrete with self cleansing design with or without vent arm including cutting and making good the walls and floors. etc., complete.(BATHROOM,BALCONY)	Nos.	24.00	
10	Supply and fixing C.P hinged trap cover of 6mm thick and having perforations with rim including setting in floor with cement mortar or white cement	Nos.	24.00	

Price Schedule / Bid to be uploaded ONLINE In MSTC

BoQ Item Sl. No.	Item Specification	UoM (Unit of Measure ment)	Quantity	Quoted Unit Rate (excluding GST) in Rs.	Amount in Rs.
11	Supplying, fixing, testing and commisioning **PVC Rainwater Pipes** (SWR) Type-A confirming to IS13592 :2013, with rubber ring (confirming to IS 5382)with solvent joint inclusive of all necessary with all fittings like bends 45 or 90 degree, 'Y's, tees, offsets, door bends, coupler, reducer, junctions, screw type caps, vent cowl fixed in the pipe shafts on pipe racks (Vertical stacks and horizontal pipes).fittings to be confirming to IS 14735:1999. Supports to be painted with anti corrosive paints to avoid corrosion to meke the system complete in all respect.				
a	75 mm dia (Type-A for shaft & 6kgf for underground / concealed)	Rmt	30.00		
b	110mm dia (Type-A for shaft & 6kgf for underground / concealed)	Rmt	60.00		
c	160mm dia (Type-A for shaft & 6kgf for underground / concealed)	Rmt	145.00		
12	Constructing brick masonry rain water **chamber** , and depth, (clear inside dimension) for single pipeline, using table moulded non-modular bricks of class designation 50 in cement mortar 1:5, C.I cover withframe (light duty) internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23kg and weight of frame 15 kg) R.C.C. top slab with cement concrete M 15 with 20mm and downsize granite metal, foundation concrete M 5 with 40mm and downsize granite metal inside plastering 12mm thick with cement mortar 1:3, finish smooth with a floating coat of ement on walls and bed concrete complete as per tandard design including cost of materials, labour charges, curing complete as per specifications. (inside dimesion) for single pipeline, using table oulded non-modular bricks of class designation 50m in cement mortar 1:5, C.I. coyer withframe				
a	Rainwater chamber 600x600x600mm	Nos.	1.00		
b	Rainwater chamber 600x600x900mm	Nos.	2.00		
c	Rainwater chamber 1200x900x1200mm	Nos.	4.00		
13	Drilling with Core cutting machine in RCC slabs, floors etc., for laying pipes and rendering the same in RCC 1:2:4, finishing the same to the satisfaction of the owner or his authorized representatives etc., The quoted rate shall also include for providing Bore Packing with appropriate materials & Fosroc / equivalent based water proofing compound for sealing the joints around the pipes etc., complete.(Inside Toilets Only & may vary as per actauls)				
a	25mm dia to 50mm dia	Rmt	7.00		
b	50mm dia to 110mm dia	Rmt	25.00		
c	110mm dia to 160mm dia	Rmt	28.00		
14	Supply, installation, testing and commissioning of heavy duty **copper float valve** confirming to IS: 1703. specification.	Nos.	1.00		
15	Supplying, installing and commissioning approved make **digital water level indicators** including wall MS mounting stands, necessary fixing materials etc., complete. The quoted rate shall exclude the necessary AC and DC wiring (stands to be painted with enamel paint).	Nos.	1.00		
	DEWATERING PUMP				

Price Schedule / Bid to be uploaded ONLINE In MSTC

BoQ Item Sl. No.	Item Specification	UoM (Unit of Measure ment)	Quantity	Quoted Unit Rate (excluding GST) in Rs.	Amount in Rs.
16	Supply, testing commisioning of Submersible cutter pumps with Isolation valves, NRV,Y Strainer, Pressure Gauge, Level switch, single Control panel for both pumps with single incoming from main electrical panel and Electrical power cable and control cables of required size as per OEM from panel to pump to be included in the cost. Control panel shall be placed to the nearest column to the sump.for 1.5 LPS @ 45m head in the raw water RUG tank to Landscape	set	1.00		
17	Supply, testing commissioning of Submersible cutter pumps with Isolation valves, NRV,Y Strainer, Pressure Gauge, Level switch, single Control panel for both pumps with single incoming from main electrical panel and Electrical power cable and control cables of required size as per OEM from panel to pump to be included in the cost. Control panel shall be placed to the nearest column to the sump.for 1 LPS @ 45m head in the raw water BUG tank to municipal drain	set	1.00		
	SANITARY FIXTURES & FITTINGS:				
18	Providing, storing, shifting to site and fixing of 50% colour vitreous China European wall hung mounted water closet with 'P' or 'S' trap matching colour solid plastic seat and lid with C P brass hinges, rubber buffers, C.I / M.S Brackets, 40 mm diameter flush bend with fittings and clamps, overflow arrangements with specials and 25 mm dia mosquito proof coupling of approved design, concealed flushing cistern, front operated with cover plate, flush pipe, flush actuator, actuator plate as required. The cost shall include painting of fittings and brackets, cutting and making good the wall and floor wherever required, including cost of materials, labour including lead and lift charges, all complete as per specifications. Make -Jaquar, Kohler, and equivalent.	Nos.	13.00		
19	Supplying, installing, testing and commissioning of white colour counter top wash basin.The basin is mounted over granite/C.I./ M.S Bracket with the following fittings like 32 mm CP brass full thread waste coupling, 32 mm CP brass P trap of casted type with extension pipe,Sensor tap, 450 mm long PVC inlet connecting pipes and brass/ SS nuts, 1 Nos 15 mm CP brass angular stop cock with wall flanges with extension pipe, 15mm dia SS/matte finish/matte finish angle cock, flexible inlet connection pipe G.I. expansion bolts etc., complete including silicon sealant. Flow rate 1.5 Lts/min Make -Jaquar, Kohler, and equivalent.	Nos.	15.00		
20	Supplying, Installing, testing and commissioning of approved make 15mm SS/matte finish/ polymer/ powder coated health faucet with flexible tube 1.0m long, SS/matte finish crutch, nozzle etc., complete. Make -Jaquar, Kohler, and equivalent.	Nos.	13.00		
21	Supply and fixing of Winter white colour vitreous china Large Flat Back Urinal of size of approved make without Sensor, Stainless steel grating should be installed over the fabricated PE floor trap below the urinal bowl, complete with C.I. Bracket fixing to wall dado with required materials like teak wood plugs packing pieces, screw nails etc, Bottle trap , SS/matte finish Spreader, Pipe, SS/matte finish Dome Coupling etc. complete, testing and commissioning the installation. connecting the urinal with waste pipe, trap etc. complete. (350 ml post litres per flush). Make -Jaquar, Kohler, and equivalent.	Nos.	7.00		
22	Supplying, installing, testing and commissioning approved make concealed stop cock 13mm with wall flange Make -Jaquar, Kohler, and equivalent.	Nos.	12.00		
23	Providing and fixing of 15mm dia SS/matte finish/ polymer/ powder coated Bib cock with SS/matte finish wall flange and accessory . Make -Jaquar, Kohler, and equivalent.	Nos.	13.00		

Price Schedule / Bid to be uploaded ONLINE In MSTC

BoQ Item Sl. No.	Item Specification	UoM (Unit of Measure ment)	Quantity	Quoted Unit Rate (excluding GST) in Rs.	Amount in Rs.
24	Supply and fixing of brass/ss/matte finish TOWEL RING with all necessary screw fitting complete fittings. Make -Jaquar, Kohler, and equivalent.	Nos.	13.00		
25	Supply and fixing of brass/ss/matte finish Coat hook with all necessary screw fitting complete fittings. Make -Jaquar, Kohler, and equivalent.	Nos.	13.00		
26	Supply and fixing of brass/ss/matte finish soap dish with all necessary screw fitting complete fittings. Make -Jaquar, Kohler, and equivalent.	Nos.	15.00		
	Sub-total C: Plumbing and Sanitary Works				

Price Schedule / Bid to be uploaded ONLINE In MSTC

BoQ Item Sl. No.	Item Specification	UoM (Unit of Measure ment)	Quantity	Quoted Unit Rate (excluding GST) in Rs.	Amount in Rs.
D	**Fire Fighting Works**				
	Addresable Smoke Detection- Wired				
	Providing Smoke Detection Control Panel - 1-8 Loop,				
1	Supply, install, test and commissioning of addressable peer to peer Networkable analogue addressable type fire alarm control panel with minimum **1500 Character /240X64 Pixel / 7inch Touchscreen** graphic LCD display. The panel should be equipped with sufficient numbers of loop with 20% spare capacity, with each networkable intelligent fire alarm Control Panel having SLC with capacity of min 126/240 detectors/ devices in any combination with key pad, dual flash-based microprocessor technology, inbuilt USB Port for upload and down load the configuration tools, RS232 serial port for direct PC or modem connection, inbuilt NAC's, min 20 programmable Zonal LEDs and operates on 240V AC + 10% with 50 Hz with built in charger. The panel shall have fire, fault relays, option of BMS integration MODBUS/ BACKNET, graphical software for provision of TCP/ IP modules, Remote Access, Class 'X' wiring with provision of both class 'A' and class 'B' wiring in the SLC circuit, user friendly with communication facility to monitor & control the FACPs from a single window. The panel shall be suitable for minimum of 5000 event record facility, event fetch from FACP facility and the single panel shall be suitable for min 2000 fire zones and 200 Panels/ Nodes in one network with all other accessories required to successfully run the system. (The System cost shall be included of all necessary cards, modules, Panel enclosure, CPU and associated accessories to complete the system design). Approval: UL				
a	2 Loop Panel	Each	1		
	Repeater Panel				
2	Supply, Installation , Testing & Commissioning of Network Active Repeater Panel with 1500 Character / 240X64 Pixel / 7inch Touchscreen. The LCD shall Display all events / detectors, devices status of complete systems in the networked. Approval: UL	Each	1		
	Multi Sensor Detector Model				
3	Supply, install, test and commissioning of analogue addressable Multisensor having three sensors (OH2) i.e. one optical and dual heat sensor (Static and ROR both), It shall have multiple modes with min five different optical sensitivity adjustment from 1.1%/m to 4.2%/m and to be possible to configure the detector to work in any of	Each	68		

Price Schedule / Bid to be uploaded ONLINE In MSTC

	the modes such as only optical type or only heat type or combined type. 360° Visible Tri- coloured led for Normal, Fault and alarm condition, addressing shall be by means of Soft addressing or dip switches or decade switches, or suitable punched cards. (For Detectors/Device without inbuilt isolator, Fault Isolator or Isolator base to be provided with each detector/device) Approval: UL			
	Monitor/Control Module			
4	Supply, install, test and commissioning of Analogue addressable Monitor Cum Control (Input/Output) module (1+1) with inbuilt relay and isolator with LED indicator, approved to operate in –10°C to +55°C temperature, complies with the essential requirement of the EMC Directive to be supplied with Junction Box, Glands and other mounting accessories for proper installation. In case of Manufacturer with single Input or Output module need to supply One quantity of each for line item. (For Detectors/Device without inbuilt isolator, Fault Isolator or Isolator base to be provided with each detector/device) Approval: UL	Each	6	
	Manual Call Point			
5	Supply, install, test and commissioning of Analogue addressable Manual Call Point (Resettable Type) with inbuilt isolator and LED indicator, designed for IP44 requirements and approved to operate in –10°C to +55°C temperature, complies with the essential requirement of the EMC Directive to be supplied with Barriers, Junction Box, Glands and other mounting accessories for proper installation. (For Detectors/Device without inbuilt isolator, Fault Isolator or Isolator base to be provided with each detector/device) Approval: UL	Each	6	
6	Supplying Installing, testing and commissioning of Response Indictor constists of twin LED wioth electronic circutarx work on 24 DC enclose in PVC retangular.complete including cost of materials, labour, usage charges of machinery complete as per specifications.	Each	25	
7	Supplying and fixing sheet metal box made out of 18 SWG sheet metal with necessary holes for cable/conduit entry as required with one coat of primer of approved make etc. including cost of materials, labour, usage charges of machinery complete as per specifications.	Each	18	
8	SITC of 7AM-12 V Battery for fire alaram system suiable for operating for 24 hours in normal condition and 30 mins in alarm condition.	Each	1	
9	Supplying Installing, testing and commissioning of Public address system (Two way comminication type) as per requirement of Fire Force authority and which Generally omprise of Supplying Installing, testing and commissioning of Approved make 5 W.wall mounted speaker with talk back facility with store enamel painted M.S.Sheet hosing etc. complete including cost of materials, labour, usage charges of machinery complete as per specifications.	Each	6	
10	Supplying Installing, testing and commissioning of P.A.System console panel with push button with speaker and indictoron Accomdated in M.S.Cabinet with painting including cost of materials, labour, usage charges of machinery complete as per specifications			
a	6 Zone cansole. complete	Each	1	
11	P.A.System amplifier 250W RM S out put with complete wiring and controls accessable form front	Each	1	
12	3 class 5 of IS:8130-1984 and (Virgin) PVC insulation and sheathed suitable for working voltage upto 11OOVolts as per IS-694:1990 & confirming to GTP of GROUP-A. 2C x 1.50 Sqmm including cost of materials, labour,	RMT	1	

Price Schedule / Bid to be uploaded ONLINE In MSTC

Price Schedule / Bid to be uploaded ONLINE In MSTC

	usage charges of machinery complete as per specifications. Make- HEMFLEX			
	Escape Singage			
13	Providing's Escape Singage Photoluminescent rigid plastic, 2 mm thickness, Printed on High Quality glass paint with UV resistance, 5 years warranty, Material Used -Non Radiocactive, non-phosphorous, non toxic and lead free. Available in different types & sizes, Time after removing the light source (in minutes) 60 minutes, Luminescent intensity (milicandelas * per square meter - mcd/sqm) : 30 mcd/sqm.Luminescent Intensity greater than 0.32 mcd/sqm, Period of Light Decay* (In Minutes) :3100, including cost of materials, labour, usage charges of machinery complete as per specifications.17 nos to be considered	Sqcm	12000	
	Singages for Walls/Floors			
14	Providing's Escape Singage Photoluminescent rigid plastic, 2 mm thickness, Printed on High Quality glass paint with UV resistance, 5 years warranty, Material Used -Non Radiocactive, non-phosphorous, non toxic and lead free. Available in different types & sizes, Time after removing the light source (in minutes) 60 minutes, Luminescent intensity (milicandelas * per square meter - mcd/sqm) : 30 mcd/sqm. Luminescent Intensity greater than 0.32 mcd/sqm, Period of Light Decay* (In Minutes) :3100, including cost of materials, labour, usage charges of machinery complete as per specifications.6 nos to be considered	Sqcm	4000	
15	**Fault Isolator Module** for Isolating short / dewired / loose circuits with automatic resetting arrangement. The device shall have an LED which shall blink in normal state & get steady on activation to monitor the heath status of the device. Module shall be supplied with mounting plate from OEM for ease of installation & maintenance.	Nos	4	
	CONDUITS, CABLES & ACCESSORIES			
16	2 C X 1.5 Sq mm multi stranded twisted and shielded unarmoured flexible LSZH Fire Survial Copper cable for FA system. The colour of the cable shall be Red.	Mtrs	1200	
17	3 C X 1.5 Sq mm multi stranded twisted and shielded unarmoured flexible LSZH Fire Survial Copper cable for FA system. The colour of the cable shall be Blue/black.	Mtrs	450	
	Sub-total D: Fire Fighting Works			

Price Schedule / Bid to be uploaded ONLINE In MSTC

Summary of Price Schedule:

BoQ Part No.	Description of Works	Amount (Rs.)
A	**CIVIL WORKS**	
B	**ELECTRICAL WORKS**	
C	**PLUMBING AND SANITARY WORKS**	
D	**FIRE FIGHTING WORKS**	
E	**TOTAL FOR THE PROJECT EXCLUDING GST**	
F	ADD GST @ 18%	
G	**GRAND TOTAL INCLUDING GST @ 18%**	

Price Schedule / Bid to be uploaded ONLINE In MSTC

NOTE:

1. *The rates quoted are with all awareness and after going through the tender documents in details.*
2. *Price should be quoted in MSTC Portal exactly as per format given above. Multiple rates for single item would lead to rejection of offer.*
3. *Bidders are required to quote the price within 2 decimal places. Price quoted with more than 2 decimal places will be rounded off to 2 decimal places for evaluation.*

4. We confirm that the quoted price is inclusive of all statutory levies, GST, duties, packing, forwarding, freight, handling, loading, unloading, installation, insurance charges, etc. for services offered and is firm.
5. Payment will be made as per the actual work carried out.
6. We confirm that there would not be any price escalation during the tenure of contract.
7. We confirm that we will abide by all the tender terms & conditions of tender, scope of work and we do not have any counter conditions.
8. We confirm that tendered item will be supplied as per specifications and tender conditions
9. The tender will be decided on the overall lowest L1 basis and after considering Additional Factors and Parameters for Evaluation and Ranking of Responsive Tenders as mentioned under GIT and SIT of this tender and then Contract will be awarded accordingly.

Declaration

- I/We agree that on being successful in the tender, we would carry out the work exactly as per Scope of Work and Responsibility of the Contractor mentioned in Scope of Work (Section-VII) and all other terms and Conditions of the Tender.
- I/We confirm that the quoted prices shall be valid till the completion of entire work and also confirm that the rates quoted is inclusive of taxes as applicable and shall remain firm & binding and no escalation on above on any account shall be admissible during the currency of the contract except for changes in GST payments for which documentary proof should be attached for claiming escalation, if any.

Thanking you,

Yours faithfully,

( )

Name: ……
(Authorised Signatory of the bidder firm with date)

Section XII: Bidder Information

Bidder shall fill in this Form following the instructions indicated below. In case a statement does not apply to a bidder, the same should be answered with the remark "Not Applicable".

Wherever necessary and applicable, the bidder shall enclose certified copy as documentary proof / evidence to substantiate the corresponding statement.

In case a bidder furnishes a wrong or evasive answer against any of the under mentioned question / issues, its bid will be liable to be ignored.

1. Bidder particulars

a) Name of the Company: .....

b) Nature of the Company (Proprietorship/Partnership/Limited Company/Co-op. Society etc.):..... ....

c) Corporate Identity No. (CIN), if available: .....

d) Registration with BRBNMPL, if applicable: .....

e) GeM Supplier ID (if registered with GeM, ~~it is mandatory at the time of placement of Contract~~) .....

f) Place of Registration/Principal place of business/manufacture .....

g) Complete Postal Address: .....

.....

h) Pin code/ZIP code: .....

i) Telephone Nos. (with country/area codes): .....

j) Fax No. (with country/area codes): .....

k) Cell phone Nos. (with country/area codes): .....

l) Contact persons/Designation: .....

m) Email IDs: .....

If asked, submit documents to demonstrate eligibility – A self-certified copy of registration certificate – in case of a partnership firm – Deed of Partnership; in case of Company – Notarized and certified copy of its Registration; and in case of Society – its Byelaws and registration certificate of the firm.

2. Taxation Details:

a) PAN number: .....

b) Type of GST Registration as per the Act (Normal Taxpayer, Composition, Casual Taxable Person, SEZ, etc.): .....

c) GSTIN (in Consignor and Consignee States): .....

d) Registered / Certified Works / Factory where the Goods would be mainly manufactured and Place of Consignor for GST Purpose: .....

e) Contact Names, Nos. & email IDs for GST matters (Please mention primary and secondary contacts): .....

.....

☐ We solemnly declare that our GST rating on the GST portal / Govt. official website is NOT negative / blacklisted.

☐

Documents to be submitted: Self-attested Copies of PAN card and GSTIN Registration.

3. Other Essential Details:

a) Provident Fund

Code No.: .....

Name of Establishment (as per Provident Fund Certificate): .....

b) Professional Tax

Enrolment Certificate No.: .....

Name of Establishment (as per Professional Tax Registration Certificate): .....

.....

c) ESI/WC/Any other Insurance

Code No.: .....

Name of Employer (as per ESI/WC/Any other Insurance Certificate): .....

Documents to be submitted: Self-attested Copies of Provident Fund, Professional Tax Registration (with latest Professional Tax paid receipt) and ESI/ WC/ Any other Insurance.

4. Authorization of Person(s) signing the bid on behalf of the Bidder

a) Full Name: .....

b) Designation: .....

c) Signing as:

- ☐ A sole proprietorship firm. The person signing the bid is the sole proprietor/ constituted attorney of the sole proprietor,
- ☐ A partnership firm. The person signing the bid is duly authorised being a partner to do so, under the partnership agreement or the general power of attorney,
- ☐ A company. The person signing the bid is the constituted attorney by a resolution passed by the Board of Directors or in pursuance of the Authority conferred by Memorandum of Association.

If asked, documents to be submitted: Registration Certificate / Memorandum of Association / Partnership Agreement / Power of Attorney / Board Resolution

5. Bidder's Authorized Representative Information

a) Name: .....

b) Address: .....

.....

c) Telephone/Mobile numbers: .....

d) Email Address: .....

.....
(Signature with date)

(Full name, designation & address of the person duly authorized sign on behalf of the tenderer)
For and on behalf of .....
(Name, address and stamp of the tendering firm)

Section XIII: Model Form of Bank Guarantee Bond for Bid Security (EMD)

1. In consideration of BHARATIYA RESERVE BANK NOTE MUDRAN PRIVATE LIMITED (hereinafter called 'BRBNMPL') having agreed to exempt _____ [hereinafter called 'the said Tenderer'] from the demand, under the terms and conditions of Tender No. _____ dated _____ for _____ (hereinafter called 'the said Tender'), of bid security (EMD) for the due fulfilment by the said Tenderer of the terms and conditions contained in the said Tender, on production of a bank Guarantee for ₹ _____ (Rupees _____ Only), we, _____, (indicate the name of the bank) (hereinafter referred to as 'the Bank') at the request of _____ [Tenderer] do hereby undertake to pay to BRBNMPL an amount not exceeding ₹ _____ against any claim by BRBNMPL by reason of any breach by the said Tenderer of any of the terms or conditions contained in the said Tender.

2. We, _____, (indicate the name of the bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from BRBNMPL stating that the amount claimed is due because of withdrawal of the tender by the said Tenderer or any material alteration to the tender carried out by the said Tenderer after its opening or because of failure to accept the Letter of Intent or Agreement by the said Tenderer or by reason of any other breach by the said Tenderer of the terms and conditions contained in the said Tender. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding ₹ _____.

3. We undertake to pay to BRBNMPL any money so demanded notwithstanding any dispute or disputes raised by the said Tenderer in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the said Tenderer shall have no claim against us for making such payment.

4. We, _____, (indicate the name of bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the finalization of the said Tender and that it shall continue to be enforceable till the said Tender is finally decided and orders placed on the successful Tenderer and/or till all the dues of BRBNMPL under or by virtue of the said Tender have been fully paid and its claims satisfied or discharged or till BRBNMPL certifies that the terms and conditions of the said Tender have been fully and properly carried out by the said Tenderer and accordingly, discharges this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the _____ we shall be discharged from all liability under this guarantee thereafter.

5. We, _____, (indicate the name of bank) further agree with BRBNMPL that BRBNMPL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Tender or to extend the time of submission of the said Tender from time to time or to postpone for any time or from time to time any of the powers exercisable by BRBNMPL against the said Tenderer and to forbear or enforce any of the terms and conditions relating to the said Tender and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Tenderer or for any forbearance, act or omission on the part of BRBNMPL or any indulgence by BRBNMPL to the said Tenderer or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Tenderer/Bidder.

7. We, _____, (indicate the name of bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of BRBNMPL in writing.

Banks may insert the following "Notwithstanding" Clause as per the standard format given below:

8. Notwithstanding anything contained herein:

a) Our liability under this bank guarantee shall not exceed ₹ _____ (Rupees _____ Only);

b) This bank guarantee shall be valid up to _____ ; (being the date of expiry of the guarantee)

c) The Beneficiary's right as well as the Bank's liability under this guarantee shall stand extinguished unless a written claim or demand is made under this guarantee on or before _____ (being the date of expiry of claim period which in no case should be less than 1 year from the date of expiry of validity period of BG as per clause (b) above);

d) This Bank Guarantee must be returned to the bank upon expiry of claim period. If the Bank Guarantee in original is not received by the bank after expiry of claim period, subject to the terms and conditions contained herein, it shall be deemed to be automatically cancelled.

9. Dated the _____ day of _____ (month) _____ (year)

For _____ (indicate the name of the Bank)

Bank Guarantees issued through SFMS platform:

BG can also be issued through IFN 760 COV Bank Guarantee Advice Message / IFN 767 COV Bank Guarantee Amendment Message to Advising Bank Branch (Beneficiary's Bank Branch) through SFMS platform

1. In that case, the BG issued by the issuing bank on behalf of Bidder / Supplier / Contractor in favour of "Bharatiya Reserve Bank Note Mudran Private Limited" shall be in paper form and also shall be made available under the "Structured Financial Messaging System" (SFMS). (Ref: GoI, MoF letter F.No.7/112/2011-BOA dated 07.07.2012)

2. The Bidder / Supplier / Contractor shall ensure issuance of IFN 760 COV BG Advising Message by the issuing bank through SFMS platform in order to make the paper Bank Guarantee operative.

3. The issuing bank shall directly send the reference number of SFMS transmission message to BRBNMPL through Speed Post / Courier.

4. The details of beneficiary for issue of BG under SFMS platform is furnished below:

Name and address of Beneficiary	:	Bharatiya Reserve Bank Note Mudran Private Limited, No. 3&4, 1st Stage, 1st Phase, B.T.M. Layout, Bannerghatta Road, Post Box No. 2924, Bengaluru – 560029, Karnataka
Beneficiary Bank, Branch and Address	:	State Bank of India (06861), Overseas Branch Bangalore, No. 65, St. Marks Road, Bengaluru-560001, Karnataka
Account Type and Number	:	Cash Credit 10605523157
IFSC Code	:	SBIN0006861
MICR Code	:	560002056

5. The Bank Guarantee submitted shall also be subject to verification from the issuing bank, hence the email ID of bank must be incorporated in the BG.

Section XIV: Manufacturer's Authorization Form

(PM/SBD/004)

सेवा में / To
मुख्य महाप्रबंधक / The Chief General Manager,
बीआरबीएनएमपीएल / BRBNMPL,
बेंगलूरु / Bengaluru – 560029

Dear Sirs,

Ref. Your e-Tender Enquiry No. 008/CO/OT/2023-24 dated February 29, 2024

We, ……., who are proven and reputable manufacturers of the tendered Goods, having factories at ……., hereby authorise Messrs. ……. *(name and address of the authorized representative)* to submit a bid, process the same further and enter into a contract with you against your requirement as contained in the above referred tender enquiry documents for the above goods manufactured by us.

We further confirm that no supplier or firm or individual other than Messrs. ……. *(name and address of the above authorized representative)* is authorized to submit a tender, process the same further and enter into a contract with you against your requirement as contained in the above referred tender enquiry documents for the above goods manufactured by us.

As principals, we also hereby extend our full warranty, as applicable as per clause 16 of the General Conditions of Contract read with modification, if any, in the Special Conditions of Contract for the goods and services offered for supply by the above firm against this tender document and also undertake to abide by other tender terms and conditions.

If stipulated in the tender document, the following documents may be enclosed,

We enclose herewith, as appropriate, our _____ (Bye-Laws / Registration Certificate / Memorandum of Association / Partnership Agreement / Power of Attorney / Board Resolution)

Yours faithfully,

……

[signature with date, name and designation]

for and on behalf of Messrs……
[name & address of the manufacturers]

Note: This letter of authorisation should be on the letter head of the manufacturing firm and should be signed by a person competent and having the power of attorney to legally bind the manufacturer

SECTION XV: Model Form of Bank Guarantee Bond for Performance Security

1. In consideration of BHARATIYA RESERVE BANK NOTE MUDRAN PRIVATE LIMITED (hereinafter called 'BRBNMPL') having agreed to exempt _____ [hereinafter called 'the said Contractor(s)'] from the demand, under the terms and conditions of an Agreement dated _____ made between _____ and _____ for _____ (hereinafter called 'the said Agreement'), of security deposit for the due fulfilment by the said Contractor(s) of the terms and conditions contained in the said Agreement, on production of a bank Guarantee for ₹ _____ (Rupees _____ Only), we, _____, (indicate the name of the bank) (hereinafter referred to as 'the Bank') at the request of _____ [contractor(s)] do hereby undertake to pay to BRBNMPL an amount not exceeding ₹ _____ against any loss or damage caused to or suffered or would be caused to or suffered by BRBNMPL by reason of any breach by the said Contractor(s) of any of the terms or conditions contained in the said Agreement.

2. We, _____, (indicate the name of the bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from BRBNMPL stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by BRBNMPL by reason of breach by the said contractor(s) of any of the terms or conditions contained in the said Agreement or by reason of the contractor(s)' failure to perform the said Agreement. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding ₹ _____.

3. We undertake to pay to BRBNMPL any money so demanded notwithstanding any dispute or disputes raised by the contractor(s)/supplier(s) in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the contractor(s)/supplier(s) shall have no claim against us for making such payment.

4. We, _____, (indicate the name of bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of BRBNMPL under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till BRBNMPL certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said contractor(s) and accordingly discharges this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the _____ we shall be discharged from all liability under this guarantee thereafter.

5. We, _____, (indicate the name of bank) further agree with BRBNMPL that BRBNMPL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by BRBNMPL against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act or omission on the part of BRBNMPL or any indulgence by BRBNMPL to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s)/Supplier(s).

7. We, _____, (indicate the name of bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of BRBNMPL in writing.

Banks may insert the following "Notwithstanding" Clause as per the standard format given below:

8. Notwithstanding anything contained herein:

a) Our liability under this bank guarantee shall not exceed ₹ _____ (Rupees _____ Only);

b) This bank guarantee shall be valid up to _____ ; (being the date of expiry of the guarantee)

c) The Beneficiary's right as well as the Bank's liability under this guarantee shall stand extinguished unless a written claim or demand is made under this guarantee on or before _____ (being the date of expiry of claim period which in no case should be less than 1 year from the date of expiry of validity period of BG as per clause (b) above);

d) This Bank Guarantee must be returned to the bank upon expiry of claim period. If the Bank Guarantee in original is not received by the bank after expiry of claim period, subject to the terms and conditions contained herein, it shall be deemed to be automatically cancelled.

9. Dated the _____ day of _____ (month) _____ (year)

For _____ (indicate the name of the Bank)

Bank Guarantees issued through SFMS platform:

BG can also be issued through IFN 760 COV Bank Guarantee Advice Message / IFN 767 COV Bank Guarantee Amendment Message to Advising Bank Branch (Beneficiary's Bank Branch) through SFMS platform

1. In that case, the BG issued by the issuing bank on behalf of Bidder / Supplier / Contractor in favour of "Bharatiya Reserve Bank Note Mudran Private Limited" shall be in paper form and also shall be made available under the "Structured Financial Messaging System" (SFMS). (Ref: GoI, MoF letter F.No.7/112/2011-BOA dated 07.07.2012)

2. The Bidder / Supplier / Contractor shall ensure issuance of IFN 760 COV BG Advising Message by the issuing bank through SFMS platform in order to make the paper Bank Guarantee operative.

3. The issuing bank shall directly send the reference number of SFMS transmission message to BRBNMPL through Speed Post / Courier.

4. The details of beneficiary for issue of BG under SFMS platform is furnished below:

Name and address of Beneficiary	:	Bharatiya Reserve Bank Note Mudran Private Limited, No. 3&4, 1st Stage, 1st Phase, B.T.M. Layout, Bannerghatta Road, Post Box No. 2924, Bengaluru – 560029, Karnataka
Beneficiary Bank, Branch and Address	:	State Bank of India (06861), Overseas Branch Bangalore, No. 65, St. Marks Road, Bengaluru-560001, Karnataka
Account Type and Number	:	Cash Credit 10605523157
IFSC Code	:	SBIN0006861
MICR Code	:	560002056

5. The Bank Guarantee submitted shall also be subject to verification from the issuing bank, hence the email ID of bank must be incorporated in the BG.

Section XVI: Contract Form
(PM/SBD/006)

……
(Address of BRBNMPL's office issuing the contract)

Contract No. ..... dated ……..

This is in continuation to this office' Notification of Award No. …….. dated ……..

1. Name & address of the Supplier: ……..

2. BRBNMPL's Tender document No. …….. dated …….. and subsequent Amendment No. …….. dated …….. (if any), issued by BRBNMPL.

3. Supplier's Tender No. …….. dated …….. and subsequent communication(s) No…….. dated …….. (If any), exchanged between the supplier and BRBNMPL in connection with this tender

4. In addition to this Contract Form, the following documents etc., which are included in the documents mentioned under paragraphs 2 and 3 above, shall also be deemed to form and be read and construed as part of this contract:

   i. General Conditions of Contract;
   ii. Special Conditions of Contract;
   iii. List of Requirements;
   iv. Technical Specifications;
   v. Quality Control Requirements;
   vi. Tender Form furnished by the supplier;
   vii. Price Schedule(s) furnished by the supplier in its tender;
   viii. Manufacturers' Authorisation Form (if applicable for this tender);
   ix. BRBNMPL's Notification of Award

   Note: The words and expressions used in this contract shall have the same meanings as are respectively assigned to them in the conditions of contract referred to above. Further, the definitions and abbreviations incorporated under Section-V - 'General Conditions of Contract' of BRBNMPL's Tender document shall also apply to this contract.

5. Some terms, conditions, stipulations etc. out of the above-referred documents are reproduced below for ready reference:

   (i) Brief particulars of the goods and services which shall be supplied / provided by the supplier are as under:

Schedule No.	Brief description of goods / services with HSN / SAC Code	Accounting unit	Quantity to be supplied	Unit Price (In ₹)	GST @ _%	Total price

   Any other additional services (if applicable) and cost thereof:
   Total value (in figure) …….. (In words) ……..

   (ii) Delivery schedule

   (iii) Details of Performance Security

   (iv) Quality Control

(a) Mode(s), stage(s) and place(s) of conducting inspections and tests.

(b) Designation and address of BRBNMPL's inspecting officer

(v) Destination and despatch instructions

(vi) Consignee, including port consignee, if any

(vii) Warranty clause

(viii) Payment terms

(ix) Paying authority

……

(Signature, name and address of BRBNMPL's authorized official)

For and on behalf of ……..

Received and accepted this contract

……

(Signature, name and address of the supplier's executive duly authorized to sign on behalf of the supplier)

For and on behalf of ……..

(Name and address of the supplier)

……

(Seal of the supplier)

Date :

Place :

Section XVII: Letter of Authority for attending a Bid Opening

(Refer to clause 24.2 of GIT)

(PM/SBD/007)

सेवा में / To

मुख्य महाप्रबंधक / The Chief General Manager,

बीआरबीएनएमपीएल / BRBNMPL,

बेंगलूरु / Bengaluru – 560029

Subject: Authorization for attending bid opening on _____ (date) for e-Tender Enquiry No.008/CO/OT/2023-24 dated February 29, 2024

Following persons are hereby authorized to attend the bid opening for the tender mentioned above on behalf of _____ (Bidder) in order of preference given below:

Order of Preference	Name	Specimen Signatures
I.		
II.		
Alternate Representative		

Note:

1. Maximum of two representatives will be permitted to attend bid opening. In cases where it is restricted to one, first preference will be allowed. Alternate representative will be permitted when regular representatives are not able to attend.

2. Permission for entry to the hall where bids are opened may be refused in case authorization as prescribed above is not produced.

Signatures of bidder with date and seal

or

Officer authorized to sign the bid documents on behalf of the bidder

Section XVIII: Eligibility Declarations

(To be submitted as part of Technical bid along with supporting documents, if any)

e-Tender Enquiry No. 008/CO/OT/2023-24 dated February 29, 2024

Bidder's Name: M/s. _____

Address: _____

Contact Details: _____

Bidder's Reference No. _____ Date _____

Note: The list below is indicative only. You may attach more documents as required to confirm your eligibility criteria.

(Please tick appropriate boxes or cross out any declaration not applicable to the Bidder)

We hereby confirm that we comply with the stipulated eligibility criteria and declare as under and shall provide evidence of our continued eligibility to BRBNMPL as may be requested:

1. **Legal Name of Bidder Firm:** ……..

2. **OEM/Authorized representative/Dealership Status:** ……..

3. We are,

   - ☐ a Joint Venture
   - ☐ not a Joint Venture

4. We solemnly declare that we (including our affiliates or subsidiaries or constituents):

   - ☐ are not insolvent, in receivership, bankrupt or being wound up, not have our affairs administered by a court or a judicial officer, not have our business activities suspended and are not the subject of legal proceedings for any of these reasons;

     (including our Contractors/subcontractors for any part of the contract):

   - ☐ Do not stand declared ineligible/blacklisted/banned/debarred by BRBNMPL or its subsidiaries or by any Ministry/Department of GoI from participating in its Tender Processes or by any Government Agency anywhere in the world, for participating in their tenders, under that country's laws or official regulations; and/or

   - ☐ Are not convicted (within three years preceding the last date of bid submission) or stand declared ineligible / suspended / blacklisted / banned / debarred by appropriate agencies of Government of India from participation in Tender Processes of all of its entities, for offences mentioned in Tender Document in this regard. We have neither changed our name nor created a new "Allied Firm", consequent to the above disqualifications.

   - ☐ Do not have any association (as bidder / partner / Director / employee in any capacity) with such retired officials or near relations of such officials of BRBNMPL.

   - ☐ We have no conflict of interest, which substantially affects fair competition. The prices quoted are competitive and without adopting any unfair/ unethical/anti-competitive means. No attempt has been made or shall be made by us to induce any other bidder to submit or not to submit an offer to restrict competition.

5. **Restrictions on procurement from bidders from a country sharing land border with India** Order (Public Procurement No. 1) issued vide F.No.6/18/2019 -PPD dated 23rd July 2020 (and its amendments, if any) by Department of Expenditure, Ministry of Finance

We certify as under:

"We have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries, and solemnly certify that we fulfil all requirements in this regard and are eligible to be considered. We certify that:

- ☐ we are not from such a country or, if from such a country, we are registered with the Competent Authority (copy enclosed); and
- ☐ we shall not subcontract any work to a contractor from such countries unless such contractor is registered with the Competent Authority.

6. **MSMEs Status**

Having read and understood the Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 (as amended and revised till date), and solemnly declare the following:

a) We are a,

- ☐ Micro Enterprise
- ☐ Small Enterprise
- ☐ Medium Enterprise
- ☐ Others

b) We are a MSE and we are classified as,

- ☐ Manufacturer
- ☐ Service Provider
- ☐ Trader / dealer / reseller / distributor / authorized agent
- ☐ Not applicable

c) We are a MSE and submit herewith Udyam Registration Certificate as proof of our being MSE registered on the Udyam Registration Portal. The certificate is the latest up to the deadline for submission of the bid.

- ☐ Udyam Registration No. ……..

d) We are a MSE and our Proprietor / Partner belongs to,

- ☐ SC *(if applicable, specify _____% of shares)*
- ☐ ST *(if applicable, specify _____% of shares)*
- ☐ Women *(if applicable, specify _____% of shares)*
- ☐ Not applicable

7. **Start-up Status**

We confirm that as per the definition of the Department of Promotion of Industrial and Internal Trade – DPIIT, we are

- ☐ a Start-up
- ☐ not a Start-up

8. **Make in India Status**

Having read and understood the Public Procurement (Preference to Make in India) Order, 2017 (as amended and revised till date) and related notifications from the relevant Nodal Ministry/Department, and solemnly declare the following:

a) **Self-Certification for category of supplier:**

(Provide a certificate from statutory auditors / cost accountant in case of Tenders above ₹10 Crore for Class-I or Class-II Local Suppliers).

Details of local content and location(s) at which value addition is made are as follows:

Local content %age	
Location(s) of value addition	

Therefore, we certify that we qualify for the following category of the supplier:

- ☐ Class-I Local Supplier
- ☐ Class-II Local Supplier
- ☐ Non-Local Supplier

b) We also declare that

- ☐ There is no country whose bidders have been notified as ineligible on reciprocal basis under this order for the offered ~~Goods~~ Works, or
- ☐ We do not belong to any Country whose bidders are notified as ineligible on a reciprocal basis under this order for the offered ~~Goods~~ Works.

9. **Confidentiality Declaration**: We hereby undertake that the information contained in this document, shall not, in whole or in part, be reproduced, transferred to other documents/ electronic media or disclosed to others without the written consent of BRBNMPL. We shall also undertake to maintenance secrecy, exclusivity and confidentiality of the high security currency printing environment of BRBNMPL.

10. **Penalties for false or misleading declarations:** We hereby confirm that the particulars given above are factually correct and nothing is concealed and also undertake to advise any future changes to the above details. We understand that any wrong or misleading self-declaration by us would be violation of Code of Ethics and would attract penalties as mentioned in this tender document, including debarment.

……..

(Signature with date)

Name and designation: ……

Duly authorized to sign bid for and on behalf of M/s……..

[Name & address of Bidder and seal of company]

Section XIX: Proforma of Bills for Payment

(PM/SBD/009)

(Refer Clause 22.6 of GCC)

(Procuring units may denote mandatory fields as per their requirement)

[Name and Address of the Firm]
PAN : …….. CIN : XXXXXXXXXXX (as per Company law)
[Regd. Office address] (as per Company law)
[Address of place of business under GST]
GSTIN of the respective place of business: ……

Bill No…….. Dated……
Purchase order No…….. Dated……

[Name and address of the consignee]
Place of supply: name of the city, name of the state

Sl. No.	Authority for purchase	Description of Stores	HSN/ SAC	Number or quantity	Taxable value	Rate/ Price	Taxable value
Total							

1. Applicable CGST, SGST, IGST and UTGST Amount
2. Freight (if applicable)
3. Packing and Forwarding charges (if applicable)
4. Others (Please specify)
5. PVC Amount (with Calculation sheet enclosed)
6. (-) deduction/Discount
7. Net amount payable (in words)

Dispatch detail RR No./other proof of dispatch…… Dated……. (enclosed)
Inspection Certificate No……Dated……. (enclosed)
Income Tax Clearance Certificate No…….. Dated……. (enclosed)
GST Registration certificate…….. (enclosed)
(If it is already being collected, the same may be ignored)

Place and Date……..

Received ₹…….. (Rupees)……..

I hereby certify that the payment being claimed is strictly in terms of the contract and all the obligations on the part of the supplier for claiming that payment has been fulfilled as required under the contract.

Signature and Stamp of Supplier

Section XX: Pre-Contract Integrity Pact

(To be executed on plain paper and applicable for all tenders of value above ₹ 5 crore)

(Shall be as per the format uploaded in Company's website)

Annexure 1

Explanatory Note on Public Procurement (Preference to Make in India) Order, 2017

- The Govt. of India has decided to incentivise the growth of local content in goods and services through the Make in India Policy by providing purchase preference to the manufacturers/service providers having capability to meet/exceed the local content targets. Incentivising enhanced local content in the procurement of goods and/or services would lead to increased local industry content.
- The ultimate aim of the policy is to support and boost the growth of domestic manufacturing sector with a view to enhancing income and employment and contribute added value to economy, absorb manpower as well as have national, regional and international competitiveness.
- Local content can be increased through partnerships, cooperation with local companies, establishing production units in India or joint ventures (JV) with Indian suppliers, increasing the participation of local employees in services and training them etc.
- The provisions of this policy shall apply to all procurements of goods, services, including System Integrator (SI) contracts, and works, including Engineering, Procurement and Construction (EPC) contracts. However, the provisions of this policy shall not apply to small procurements where estimated value to be procured is less than ₹5 lakh.

Definitions

- Domestic Products shall be goods and/or services (including design and engineering), produced by companies, investing and producing in India.
- Domestic Manufacturer shall be business entity or individual having business activity established under Indian law and producing products domestically.
- Local Content (LC) means the amount of value added in India which shall, unless otherwise prescribed by the Nodal ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent.
- Local Content (LC) in Goods shall be the use of raw materials, design and engineering towards manufacturing, fabrication, assembly and finishing of work carried out within the country.
- Local Content (LC) in Services shall be the use of services up to the final delivery by utilizing manpower (including specialists), working appliance (including software) and supporting facilities carried out within the country.
- 'Margin of purchase preference' means the maximum extent to which the price quoted by a "Class-I local supplier" may be above the L1 (lowest bid) for the purpose of purchase preference.
- Supplier of Goods and/or provider of Services shall be a business entity having capability of providing Goods and/or Services in accordance with the business line and qualification thereof and classified as under: -
  - 'Class-I local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content equal to or more than 50% as defined under Make in India policy.
  - 'Class-II local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50%, as defined under Make in India policy.
  - 'Non-local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than or equal to 20%, as defined under Make in India policy.

Eligibility to bid

- Only Class-I local suppliers and Class-II local suppliers shall be eligible to bid in all procurements except when Global Tender Enquiry, allowed if purchase value is more than ₹200 crore*, is issued.
- In local procurement of all goods, services and works in respect of which the Nodal ministry / Department has communicated that there is sufficient local capacity and local competition, only Class-I local supplier shall be eligible to bid irrespective of purchase value.
- For all other local procurements, both Class-I local supplier and Class-II local supplier shall be eligible to bid irrespective of purchase value but purchase preference shall be given to Class-I local supplier only.
- In global tender enquiries, Non-local suppliers shall also be eligible to bid along with Class-I local suppliers and Class-II local suppliers. Class-I local supplier shall be given purchase preference.
- Class-I local suppliers and Class-II local suppliers shall be eligible to get relaxations in eligibility criteria like turnover, production capability and financial strength. Eligibility criteria on previous experience shall not require proof of supply to other countries or proof of exports for any class of suppliers. However, Purchase preference shall be given to Class-I local suppliers only. Class-II local suppliers or Non-local suppliers shall not get purchase preference in any procurement.
- Bidders offering imported products/content cannot, repeat cannot, claim themselves as Class-I local suppliers/Class-II local suppliers by claiming the services such as transportation, insurance, installation, commissioning, training, after sales service support like AMC/CMC etc. as local value addition. Such bidders will fall under the category of Non-local suppliers.

S/N	Scenario	Tender Type	Tender value	Eligible bidder	Relaxation / Purchase preference
1	There **<u>is</u> sufficient local capacity and competition**	OTE/NCB	Any value	'Class-I local supplier'	• Relaxation (as per para 10 (a) and (b) of order) • **<u>No</u>** purchase preference
2	There **<u>isn't</u> sufficient local capacity and competition**	OTE/NCB	Any value	'Class-I local supplier' 'Class-II local supplier'	• Relaxation (as per para 10 (a) and (b) of order) • Purchase preference to 'Class-I local supplier'
		GTE/ICB	Any value*	'Class-I local supplier' 'Class-II local supplier' 'Non-local supplier'	• Relaxation (as per para 10 (a) and (b) of order) to Class-I and Class-II local suppliers only • Purchase preference to 'Class-I local supplier'

* For tender value < ₹200 crore, GTE/ICB shall not be issued except with the approval of Competent Authority as per amended Rule 161 (iv) of GFR 2017

Procedure for purchase preference

The manufacturers/service providers having the capability of meeting/exceeding the local content targets shall be eligible for purchase preference under the Policy as described below: -

- Where the quoted price is within the margin of purchase preference of the lowest price, other things being equal, purchase preference shall be granted to the bidder concerned (eligible techno-commercially qualified Class-I local supplier) at the lowest valid price bid. The margin of purchase preference shall be 20%.
- The successful bidder shall be obliged to fulfil the requirements of quality and delivery time in accordance with provisions of the purchase order/contract.
- BRBNMPL shall have the right to satisfy itself of the production capability and product quality of the manufacturer.
- Procedure for granting purchase preference to Class-I local suppliers under various scenarios is given in **Annex-I.**

Verification of local content

- Class-I local suppliers and Class-II local suppliers shall furnish the following undertaking from the authorized signatory of the bidder along with their techno-commercial bid. The undertaking shall become a part of the contract.

  Class-I local supplier

  "We _____ (name of the bidder) undertake that we meet the mandatory minimum local content requirement i.e. equal to or more than 50% for qualifying as Class-I local supplier as per the Make in India Policy for claiming purchase preference against tender No. _____. The percentage of local content in the bid is _____%."

  Class-II local supplier

  "We _____ (name of the bidder) undertake that we meet the mandatory minimum local content requirement i.e. more than 20% but less than 50% for qualifying as Class-II local supplier as per the Make in India Policy for participating against tender No. _____. The percentage of local content in the bid is _____%."

  Location(s) at which local value addition is made:

  _____

  _____

- In case of procurement for a value in excess of ₹10 crores, above undertaking shall be supported by the following certificate from Statutory Auditor engaged by the bidder or cost auditor of the company (in case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies), on the letterhead of such Statutory Auditor etc.

  Class-I local supplier

  "We the Statutory Auditor (or as the case may be) of M/s. _____ (name of the bidder) hereby certify that M/s. _____ (name of the bidder) meet the mandatory local content requirement of the Goods and/or Services i.e. equal to or more than 50% for qualifying as Class-I local supplier as per the Make in India Policy for claiming purchase preference against tender No. _____. The percentage of local content in the bid is _____%."

  Class-II local supplier

  "We the Statutory Auditor (or as the case may be) of M/s. _____ (name of the bidder) hereby certify that M/s. _____ (name of the bidder) meet the mandatory local content requirement of the Goods and/or Services i.e. more than 20% but less than 50% for qualifying as Class-II local supplier as per the Make in India Policy for participating against tender No. ____. The percentage of local content in the bid is ____%."

Note:

- In case of a foreign bidder, certificate (with regard to fulfilment of minimum mandatory local content requirement) from Statutory Auditor or cost auditor of their own office or subsidiary in India giving percentage of local content is also acceptable. In case office or subsidiary in India does not exist or Indian office/subsidiary is not required to appoint Statutory Auditor or cost auditor, certificate from a practicing chartered accountant in India or practicing cost accountant in India shall also be acceptable.
- In case manufacturer/service provider himself is bidding then the certificate shall be submitted by the Statutory Auditors etc. of the manufacturer/service provider.
- In case the bidder is a supplier quoting on behalf of manufacturer/service provider then the certificate shall be submitted by the Statutory Auditors etc. of the supplier. The responsibility for the certificate provided by the Statutory Auditor etc. of the supplier shall be that of the supplier.
- Each supplier shall provide the necessary local content documentation to the Statutory Auditor (or as the case may be), which shall review and determine that local content requirements have been met and issue a local content certificate to that effect, stating the % of local content in the goods or services measured. The Auditor shall keep all necessary information obtained from the supplier for measurement of local content confidential.
- During the execution of the contract, local content certificate shall have to be submitted along with each invoice raised. However, the % of local content may vary with each invoice while maintaining the overall % of local content for the total purchase of the pro-rata local content requirement. In case it is not satisfied cumulatively in the invoices raised up to that stage, the supplier shall indicate how the local content requirement would me met in the subsequent stages.
- Non-local suppliers shall also indicate percentage of local content component in their bid as under: -
  "Percentage of local content as per the make in India Policy in the bid of M/s. _____ (name of the bidder) is _____%."
- The prescribed local content in the Make in India Policy shall be applicable on the date of Notice Inviting Tender (NIT).
- Where currency quoted by the bidder is other than INR, then the bidder claiming benefits under Make in India Policy shall consider exchange rate prevailing on the date of Notice Inviting tender (NIT) for the calculation of local content.
- Since Class-I / Class-II local suppliers are eligible to bid only if they meet the local content norms, therefore, irrespective of whether they are willing to seek benefits under the Make in India Policy or not, it is mandatory for them to submit adequate documentation as follows to establish their status as Class-I / Class-II local supplier. In fact, all bidders (i.e. Class-I local suppliers, Class-II local suppliers, Non-local suppliers) are required to mention local content in their bid and to submit the requisite documents as per the requirement of the Policy.
- BRBNMPL shall have the authority to audit as well as witness production processes to certify the achievement of the requisite local content.

Determination of local content

Local content of Goods

- Local Content (LC) in Goods shall be the use of raw materials, design and engineering towards manufacturing, fabrication, assembly and finishing of work carried out within the country.
- Local content shall be computed on the basis of the cost of domestic components in goods, compared to the whole cost of the product.

- The criteria for the determination of the local content cost shall be as follows: -
  a. In the case of direct component (material), based on country of origin;
  b. In the case of manpower based on INR component;
- The calculation of local content of the combination of several kinds of goods shall be based on the ratio of the sum of the multiplication of local content (%) of each of the goods with the acquisition price of each of the goods to the acquisition price of the combination of the goods.

Local content of Services

- Local Content (LC) in Services shall be the use of services up to the final delivery by utilizing manpower (including specialists), working appliance (including software) and supporting facilities carried out within the country.
- Local content of services shall be calculated on the basis of the ratio of service cost of domestic component in service to the total cost of service.
- The total cost of service shall be constituted of the cost spent for rendering of service, covering:
  a. Cost component (material) which is used;
  b. Manpower and consultant cost; cost of working equipment/facility; and
  c. General service cost.
- The criteria for determination of cost of local content in the services shall be as follows:
  a. In the case of material being used to help the provision of service, based on country of origin;
  b. In the case of manpower and consultant based in INR component of the services contract;
  c. In the case of working equipment/facility, based on country of origin; and
  d. In the case of general service cost, based on the criteria as mentioned in clauses a, b and c above

Local content of EPC contracts

- Local content in Engineering, Procurement and Construction (EPC) contracts where supply of both goods and services are involved shall be the ratio of the whole cost of domestic components in the combination of goods and services to the whole combined cost of goods and services.
- The whole combined cost of goods and services shall be the cost spent to produce the combination of goods and services, which is incurred in the work site.
- Local content of the combination of goods and services shall be counted in every activity of the combination work of goods and services.
- The spent cost shall include production cost in the calculation of local content of goods and service cost in the calculation of local content of services.
- Local content shall be calculated on the basis of verifiable data. In case data used in calculation of local content not being verifiable, the value of local content of the said component shall be treated as 'Nil'.

False declarations and Sanctions

- BRBNMPL shall have the right to impose sanctions on the bidder/manufacturer/ service provider for not fulfilling the local content of goods/services in accordance with the value mentioned in the certificate of local content. The sanctions may be in the form of written warning, financial penalty and debarring.
- If the bidder does not fulfil his obligations after the expiration of the period specified in such warning, BRBNMPL shall have the right to initiate action for debarring such bidder or impose financial penalty on the bidder or both.
- A bidder, who has been awarded the contract after availing purchase preference, is found to have violated the local content provision in the execution of the procurement contract of goods and/or services, shall be subject to financial penalty up to a maximum of 10% of the contract value. In such a case, BRBNMPL reserves the right to invoke the performance bank guarantee submitted by the bidder.
- Class-I local suppliers and Class-II local suppliers shall furnish the following undertaking from the authorized signatory of the bidder along with their techno-commercial bid. The undertaking shall become a part of the contract.
  "We understand that false declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the GFR for which a bidder or its successor may be debarred for up to two years as per Rule 151(iii) of GFR along with such other actions by BRBNMPL as may be permissible under law including financial penalty up to a maximum of 10% of the contract value. In such a case, BRBNMPL reserves the right to invoke the performance bank guarantee submitted by the bidder."

Reciprocity clause

- Entities of countries which have been identified by the nodal Ministry/Department as not allowing Indian companies to participate in their Government procurement for any item related to that nodal Ministry, shall not be allowed to participate in Government procurement in India for all items related to that nodal Ministry/Department, except for the list of items published by the Ministry/ Department permitting their participation. The term 'entity' of a country shall have the same meaning as under the FDI Policy of DPIIT as amended from time to time.
- Hence, prospective foreign bidders intending to participate in tenders floated by BRBNMPL, shall furnish the following declaration,
  "We do not belong to any country whose bidders are notified as ineligible on reciprocal basis under the Make in India order of Government of India"

Manufacture under license / technology collaboration agreements with phased indigenization under 'Make in India'

(i) Suppliers may be exempted from meeting the stipulated local content if the product is being manufactured in India under a license from a foreign manufacturer who hold intellectual property rights and where there is a technology collaboration agreement / transfer of technology agreement for indigenous manufacture of a product developed abroad with clear phasing of increase in local content within the validity of the contract.

(ii) In procurement of all goods, services or works in respect of which the Nodal ministry has not notified that there is sufficient local capacity and local competition, procuring entities may prescribe in their respective tenders that foreign companies may participate in the tender through a subsidiary or a joint venture with an Indian company. Such subsidiaries/joint ventures may be exempted from meeting the stipulated minimum local content requirement, provided there is clear phasing of increase in local content within the validity of the contract. Such subsidiaries/joint ventures must obtain an exemption letter and submit the same along with their bid to avail the exemption.

Annexure 2

Procedure for Purchase Preference under Make in India Order, 2017

i. Procurement of Goods and Works which are *divisible* in nature (but without split order clause): -
   - If L1 is 'Class-I local supplier' – 100% awarded to L1
   - If L1 is *not* 'Class-I local supplier' – 50% awarded to L1
     - Remaining 50% awarded to lowest bidder among 'Class-I local supplier' falling within L1+20% subject to matching L1 price
     - If lowest bidder among 'Class-I local supplier' is unable to match L1 price or accepts less than offered quantity, next lowest 'Class-I local supplier' bidder within L1+20% is invited to match L1 price for remaining quantity and so on and contract will be awarded accordingly
     - If some quantity is still left uncovered on 'Class-I local supplier', then such balance quantity can be ordered on the original L1 bidder
     - If none of the 'Class-I local supplier' bidder within L1+20% is able to match L1 price or no 'Class-I local supplier' falls within L1+20%, contract awarded to original L1 bidder
   - When the tendered goods/services cannot be divided in the exact ratio of 50:50 then BRBNMPL reserves the right to award on lowest eligible Class-I local supplier for quantity not less than 50%, as may be dividable.
     E.g.: In case tendered quantity is 3 (not divisible in the ratio of 50:50), Class-I local supplier shall get order for 2 nos. and the rest will go to L1 (who is not a Class-I local supplier).

ii. Procurement of Goods and Works which are *not divisible* in nature and procurement of Services where bid is evaluated on price alone: -
   - If L1 is 'Class-I local supplier' – 100% awarded to L1
   - If L1 is *not* 'Class-I local supplier'
     - Lowest bidder among 'Class-I local supplier' falling within L1+20% is invited to match L1 price – contract awarded subject to matching L1 price
     - If lowest bidder among 'Class-I local supplier' is unable to match L1 price, next lowest 'Class-I local supplier' bidder within L1+20% is invited to match L1 price and so on and contract will be awarded accordingly
     - If none of the 'Class-I local supplier' bidder within L1+20% is able to match L1 price or no 'Class-I local supplier' falls within L1+20%, contract awarded to original L1 bidder

iii. Procedure to be adopted in case of tenders with *split order/parallel contracts* clause:
   - If in normal course of splitting of orders between L1 and L2 bidders (70:30) or L1, L2 and L3 bidders (50:30:20), 'Class-I local suppliers' qualify for award of contract for at least 50% of the tendered quantity without resorting to purchase preference, then parallel contracts may be awarded to original L1 and L2 bidders or L1, L2 and L3 bidders, as the case may be, as per the split order/parallel contracts clause stipulated in the tender
   - If, however, 'Class-I local suppliers' do not qualify for award of contract for at least 50% of the tendered quantity, purchase preference shall be given to 'Class-I local suppliers' provided their quoted rate falls within 20% of **the highest quoted bidder considered for award of contract** so as to ensure that 'Class-I local suppliers' taken in totality are considered for award of contract for at least 50% of the tendered quantity
     - In case of 2-way splitting between L1 and L2 bidders in the ratio of 70:30, the **L2** bidder shall be treated as **the highest quoted bidder considered for award of contract**
     - In case of 3-way splitting between L1, L2 and L3 bidders in the ratio of 50:30:20, the **L3** bidder shall be treated as **the highest quoted bidder considered for award of contract**

Examples of splitting of orders

- **In case of two-way splitting between L1 and L2 bidders in the ratio of 70:30**
  - If L1 is 'Class-I local supplier' – 70% awarded to L1
    - If L2 is 'Class-I local supplier' – remaining 30% awarded to L2 subject to matching L1 price
    - If L2 is *not* 'Class-I local supplier' – Remaining 30% awarded to lowest bidder among 'Class-I local suppliers' falling within **L2+20%** subject to matching L1 price
    - If lowest bidder among 'Class-I local suppliers' is unable to match L1 price or accepts less than offered quantity, next lowest 'Class-I local supplier' falling within **L2+20%** is invited to match L1 price for remaining quantity and so on and contract will be awarded accordingly
    - If some quantity is still left uncovered on 'Class-I local supplier', then such balance quantity can be ordered on the original L1 bidder
    - If none of the 'Class-I local suppliers' falling within **L2+20%** is able to match L1 price or there are no 'Class-I local suppliers' falling within **L2+20%,** then contract shall be awarded to original L1 and L2 (L3, L4…and so on) bidders in the ratio 70:30 subject to matching L1 price
  - If L1 is *not* 'Class-I local supplier' – 50% awarded to L1
    - If L2 is 'Class-I local supplier' – remaining 50% awarded to L2 subject to matching L1 price
    - If L2 is *not* 'Class-I local supplier' – Remaining 50% awarded to lowest bidder among 'Class-I local suppliers' falling within **L2+20%** subject to matching L1 price
    - If lowest bidder among 'Class-I local suppliers' is unable to match L1 price or accepts less than offered quantity, next lowest 'Class-I local supplier' falling within **L2+20%** is invited to match L1 price for remaining quantity and so on and contract will be awarded accordingly
    - If some quantity is still left uncovered on 'Class-I local supplier', then such balance quantity can be ordered on the original L1 bidder
    - If none of the 'Class-I local suppliers' falling within **L2+20%** is able to match L1 price or there are no 'Class-I local suppliers' falling within **L2+20%,** then contract shall be awarded to original L1 and L2 (L3, L4…and so on) bidders in the ratio 70:30 subject to matching L1 price
- **In case of three-way splitting between L1, L2 and L3 bidders in the ratio of 50:30:20**
  - If L1 is 'Class-I local supplier' – 50% awarded to L1
    - If L2 and L3 are 'Class-I local suppliers' – 30% and 20% awarded to L2 and L3 bidders respectively subject to matching L1 price

- If *either* L2 or L3 is a 'Class-I local supplier' – 30% awarded to L2 or L3, whoever is a 'Class-I local supplier', subject to matching L1 price – remaining 20% awarded to lowest among other 'Class-I local suppliers' falling within **L3+20%** subject to matching L1 price
  - » If there are no other 'Class-I local suppliers' falling within **L3+20%,** then the contract will be split into two in the ratio of 50:50 and the remaining 50% shall be awarded to *either* L2 or L3, whoever is a 'Class-I local supplier', subject to matching L1 price
- If L2 and L3 are *not* 'Class-I local suppliers' – remaining 30% and 20% awarded to lowest two bidders amongst 'Class-I local suppliers' falling within **L3+20%** subject to matching L1 price
- If any of the two lowest bidders among 'Class-I local suppliers' is unable to match L1 price or accepts less than offered quantity, next lowest 'Class-I local supplier' within **L3+20%** is invited to match L1 price for remaining quantity and so on and contract will be awarded accordingly
  - » If there is only one eligible 'Class-I local supplier' falling within **L3+20%** then the contract will be split into two in the ratio of 50:50 and the remaining 50% shall be awarded to the single eligible 'Class-I local supplier' subject to matching L1 price
- If some quantity is still left uncovered on 'Class-I local supplier', then such balance quantity can be ordered on the original L1 bidder
- If none of the 'Class-I local suppliers' within **L3+20%** is able to match L1 price or there are no 'Class-I local suppliers' falling within **L3+20%,** then contract shall be awarded to original L1, L2 (L3, L4… and so on) and L3 (L4, L5… and so on) bidders in the ratio 50:30:20 subject to matching L1 price

- If L1 is *not* 'Class-I local supplier' – 50% awarded to L1
  - If L2 and L3 are 'Class-I local suppliers' – 30% and 20% awarded to L2 and L3 bidders respectively subject to matching L1 price
  - If *either* L2 or L3 is a 'Class-I local supplier' – 30% awarded to L2 or L3, whoever is a 'Class-I local supplier', subject to matching L1 price – remaining 20% awarded to lowest among other 'Class-I local suppliers' falling within **L3+20%** subject to matching L1 price
    - » If there are no other 'Class-I local suppliers' falling within **L3+20%,** then the contract will be split into two in the ratio of 50:50 and the remaining 50% shall be awarded to *either* L2 or L3, whoever is a 'Class-I local supplier', subject to matching L1 price
  - If L2 and L3 are *not* 'Class-I local suppliers' – remaining 30% and 20% awarded to lowest two bidders amongst 'Class-I local suppliers' falling within **L3+20%** subject to matching L1 price
  - If any of the two lowest bidders among 'Class-I local suppliers' is unable to match L1 price or accepts less than offered quantity, next lowest 'Class-I local supplier' within **L3+20%** is invited to match L1 price for remaining quantity and so on and contract will be awarded accordingly
    - » If there is only one eligible 'Class-I local supplier' falling within **L3+20%** then the contract will be split into two in the ratio of 50:50 and the remaining 50% shall be awarded to the single eligible 'Class-I local supplier' subject to matching L1 price
  - If some quantity is still left uncovered on 'Class-I local supplier', then such balance quantity can be ordered on the original L1 bidder
  - If none of the 'Class-I local suppliers' within **L3+20%** is able to match L1 price or there are no 'Class-I local suppliers' falling within **L3+20%,** then contract shall be awarded to original L1, L2 (L3, L4… and so on) and L3 (L4, L5… and so on) bidders in the ratio 50:30:20 subject to matching L1 price

Annexure 3

Explanatory Note on
Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012

1. The definition for Micro & Small Enterprise shall be as per the guidelines issued by Ministry of MSME vide Gazette Notification No. 1702(E) dated 01.06.2020 and 2119(E) dated 26.06.2020 which came into effect from 01.07.2020.
2. MSEs must be registered with any of the following in order to avail the benefits / preference available under MSEs Order, 2012: -
   - District Industries Centers (DIC)
   - Khadi and Village Industries Commission (KVIC)
   - Khadi and Village Industries Board
   - Coir Board
   - National Small Industries Corporation (NSIC)
   - Directorate of Handicraft and Handloom
   - Any other body specified by Ministry of MSME (MoMSME)
   - Udyog Aadhaar Acknowledgment / Udyog Aadhaar Memorandum issued by MoMSME
   - Udyam Registration Portal
3. MSEs participating in the tender must submit valid & authorised copy of certificate of registration with any one of the above agencies. In case of bidders submitting DIC registration certificate, they shall attach original notarised copy of the DIC certificate.
4. The registration certificate issued from any one of the above agencies must be valid as on Bid closing date of the tender. Bidder shall ensure validity of registration certificate in case bid closing date is extended.
5. The MSEs who have applied for registration or renewal of registration with any of the above agencies/bodies, but have not obtained the valid certificate as on closing date of the tender, are not eligible for exemption/preference. Where validity of such certificates such as NSIC certificate has lapsed, it shall be the responsibility of the bidder to seek renewal from the concerned Govt. agency before such expiry. *However, documentary evidence seeking extension before the lapse of validity of such certificate and an authorization letter from the Govt. agency having received application for renewal submitted before the bid closing date shall be accepted*.
6. To be classified as Micro or Small Enterprises as per new definition, the companies need to register themselves on "Udyam Registration Portal" on or after 01.07.2020. This provision is for new establishments as well as for existing MSEs registered with NSIC, UAM etc.
7. As per the new notification by the Government of India, every business unit registered under MSME / Udyog Aadhaar shall be treated as a valid MSME up to **30th June 2022** beyond which they need to be registered on Udyam Registration Portal to enjoy the MSME Benefits.
8. The provisions of this policy shall apply to all procurements of goods and services. **Work contracts are excluded from the purview of this policy.**
9. The MSEs registered with above mentioned agencies / bodies are exempted from payment of Earnest Money Deposit (EMD) & tender fees.
10. **MSE must be a Manufacturer/Service provider:** The MSE bidder must be a Manufacturer capable of manufacturing the tendered items / Service provider capable of rendering the tendered services by themselves to avail the benefits under MSEs Order, 2012. Traders/dealers/resellers/distributors/authorized agents will not be considered for availing benefits under MSEs Order, 2012 as per guidelines issued by MoMSME.
11. **Relaxation of Norms for Micro & Small Enterprises (MSEs):** Pre-qualification criteria with respect to Prior Turnover and Prior experience may be relaxed for Micro & Small Enterprises as per GOI guidelines subject to meeting of quality and technical specifications.
12. However, there may be circumstances like procurement of items/services related to public safety, health, critical security operations and equipment, etc., wherein BRBNMPL reserves the right to not consider relaxation of Prior Turnover and Prior Experience for Micro and Small Enterprises.
13. Items which are reserved for exclusive purchase from MSEs shall be procured from Micro and Small Enterprises as per Public Procurement Policy.
14. Subject to meeting terms and conditions stated in the tender document, *at least 25%* of the total quantity of the tender is earmarked for MSEs registered with above mentioned agencies / bodies.
15. In case MSE bidder is L1, entire value of the tender is to be ordered on the L1 MSE bidder.
16. In tender, participating MSEs quoting price within price band of L1 + 15% shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price is from someone other than a MSE and such MSE shall be allowed to supply at *least 25%* of the total tendered value (where the tender quantity can be split).
17. In case of more than one such MSEs are in the price band of L1 + 15% and matches the L1 price, the supply may be shared proportionately if the job can be split.
18. In case the tendered quantity cannot be split, MSE shall be allowed to supply total tendered quantity provided their quoted price is within a price band of L1 + 15% and they match the L1 price.
19. If the quantity cannot be split and there are more than one eligible MSE bidders (price band within L1+15%) then the opportunity to match the L1 rate of the tender shall be given first to MSE (who have quoted lowest rate among the MSEs within the price band of L1+15%) and the total quantity shall be awarded to him after matching the L1 price of the tender.
20. If the MSE who have quoted lowest rate among the MSEs in the price band of L1 + 15% do not agree to match the rate of L1 of the tender, then the next ranked MSE bidder who has quoted within the price band of L1 + 15% in order shall be given chance to match the rate of L1 for award of the quantity/order.
21. For more clarity in this regard, following table is furnished: -

Type of Tender	Price quoted by MSE	Finalization of tender
Can be Split	L1	Full order on MSE
	Not L1 but within L1+15%	At least 25% order on MSE subject to matching L1 price

Type of Tender	Price quoted by MSE	Finalization of tender
Cannot be split	L1	Full Order on MSE
	Not L1 but within L1+15%	Full Order on MSE subject to matching L1 price

22. The purchase preference to MSEs is not applicable for works contracts where supply of goods not produced by MSEs is also involved.
23. **Special provision for MSEs owned by SC & ST entrepreneurs:** Out of the 25% target of annual procurement from MSEs, 4% shall be earmarked for procurement from MSEs owned by SC & ST entrepreneurs. In the event of failure of such MSEs to participate in the tender process or meet the tender requirements and L1 price, 4% sub-target so earmarked shall be met from other MSEs.
24. To qualify for entitlement as SC/ST owned MSE, the SC/ST certificate issued by District Authority in addition to certificate of registration with any one of the agencies mentioned in paragraph 1 above. Alternatively, the bidder shall be responsible to furnish necessary documentary evidence for enabling BRBNMPL to ascertain that the MSE is owned by SC/ST entrepreneurs. MSE owned by SC/ST is defined as:
    - In case of Proprietary MSE, proprietor(s) shall be SC/ST
    - In case of Partnership MSE, the SC/ST partners shall be holding at least 51% shares in the enterprise
    - In case of Private Limited Companies, at least 51% share shall be held by SC/ST promoters
25. **Special provision for MSEs owned by women entrepreneurs:** Out of the 25% target of annual procurement from MSEs, 3% shall be earmarked for procurement from MSEs owned by women entrepreneurs *in addition* to 4% earmarked for MSEs owned by SC/ ST entrepreneurs. MSE owned by Women is defined as:
    - In case of Proprietary MSE, proprietor(s) shall be Women
    - In case of Partnership MSE, the Women partners shall be holding at least 51% shares in the enterprise
    - In case of Private Limited Companies, at least 51% share shall be held by Women promoters
26. **TReDS:** TReDS is an electronic institutional mechanism for facilitating the financing of trade receivables of MSMEs through multiple financiers. BRBNMPL is already registered on the following TReDS platforms: -
    - M/s A TREDS (Invoicemart), Mumbai
27. MSE vendors are required to register on the TReDS platform. The MSME vendors can avail the TReDS facility, if they want to.

Annexure 4

Support to Start-Up Enterprises

1. Subject to meeting of Quality and Technical specifications, BRBNMPL may consider allowing the participation of "Start-up" companies with capability to execute the supply / services, as per technical specifications / perform the job as per scope of work specified in the tender and subject to meeting extant & relevant guidelines of Government of India. This should be confirmed and substantiated in the technical bid.
2. The bidder who intends to participate as "Start-up" company should enclose the Certificate of Recognition issued by Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce & Industry, Govt. of India or a certificate of an eligible Start-up from the inter-Ministerial Board of Certification during submission of Technical bid.
3. The Nature of Business mentioned in application made to get Start-up accreditation should be related to the tendered item.
4. Start-ups registered with DPIIT are exempted from payment of Earnest Money Deposit (EMD) & tender fees. However, they shall be required only to submit Bid Securing Declaration.
5. Prequalification Criteria with respect to Prior Turnover and Prior Experience may be relaxed for Start-ups as per the GOI guidelines.
6. However, there may be circumstances like procurement of items/services related to public safety, health, critical security operations and equipment, etc. wherein BRBNMPL reserves the right to not consider relaxation of Prior Turnover and Prior Experience for Start-up Companies as per GoI guidelines.
7. Start-up Companies who are also registered as MSEs and wish to avail the benefits as applicable to MSE, shall submit relevant documents covered under Conditions for Micro and Small Enterprises elsewhere in this tender.
8. Definition of Start-up Enterprises
   (i) As defined by DPIIT, an entity shall be considered as a 'Start-up':
      a) Up to a period of ten years from the date of incorporation/registration, if it is incorporated as a private limited company (as defined in the Companies Act, 2013) or registered as a partnership firm (registered under section 59 of the Partnership Act, 1932) or a limited liability partnership (under the Limited Liability Partnership Act, 2008) in India, and
      b) Turnover of the entity for any of the financial years since incorporation/ registration has not exceeded ₹100 (one hundred) crore, and
      c) The entity works towards innovation, development or improvement of products or processes or services or a scalable business model with a high potential for employment generation or wealth creation.
   (ii) Provided that an entity formed by splitting up or reconstructing an existing business shall not be considered a 'Start-up'.

Annexure 5

Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order, 2017

1. The Class-I local suppliers, under PPP-Mll Order, participating in any government tender, may or may not be MSEs, as defined under the MSME Act. Similarly, MSEs participating in any government tender, may or may not be Class-I local suppliers. Suppliers may be categorised in following four broad categories for consideration or applicability of purchase preference:

Category	**Terminology**
Supplier is both MSE & Class-I local supplier	"MSE Class-I local supplier"
Supplier is MSE but not Class-I local supplier	"MSE but non-Class-l local supplier"
Supplier is not MSE but is Class-I local supplier	"Non-MSE but Class-I local supplier"
Supplier is neither MSE nor Class-I local	"Non-MSE non-Class-l local supplier"

2. The applicability of PPP-MSE Order and PPP-Mll Order in various scenarios, involving simultaneous purchase preference to MSEs and Class-I local suppliers under PPP-MSE Order and PPP-Mll Order respectively, shall be as under:

a) *Items covered under Para 3(a) of PPP- Mll Order, 2017 for which Nodal Ministry has notified sufficient local capacity and competition:* For these items, only Class-I local suppliers are eligible to bid irrespective of purchase value. Hence, Class-Il local suppliers or Non-local suppliers, including MSEs which are Class-Il local suppliers/ Non-local suppliers, are not eligible to bid. Possible scenarios can be as under:
   (i) L-1 is "MSE Class-I local supplier" - 100% of the tendered quantity is to be awarded to L-1
   (ii) L-1 is "Non-MSE but Class-I local supplier" - Purchase preference is given to MSEs as per PPP-MSE Order. Balance quantity is to be awarded to the L-1 bidder

b) *Items reserved exclusively for procurement from MSEs as per PPP-MSE Order:* These items are reserved exclusively for purchase from MSEs. Hence, non-MSEs are not eligible to bid for these items. Possible scenarios can be as under:
   (i) L-1 is "MSE Class-I local supplier" - 100% of the tendered quantity is to be awarded to L-1
   (ii) L-1 is "MSE non-Class-l local supplier" - Purchase preference is to be given to Class-I local supplier as per PPP-Mll Order. Balance quantity, is to be awarded to L-1 bidder

c) *If items are neither notified for sufficient local capacity nor reserved for MSEs, then the process will be as follows:*
   c (a) Items covered under Para 3A(b) of PPP-Mll Order are divisible items and both MSEs as well as Class-I local suppliers are eligible for purchase preference. Possible scenarios can be as under:
      (i) L-1 is "MSE Class-I local supplier" - 100% of the tendered quantity is to be awarded to L-1
      (ii) L-1 is "Non-MSE but Class-I local supplier" - Purchase preference is to be given to MSEs, if eligible, as per PPP-MSE Order. Balance quantity is to be awarded to L-1 bidder
      (iii) L-1 is "MSE but non-Class-l local supplier" - Purchase preference is to be given to Class-I local suppliers, if eligible, as per PPP-Mll Order. Balance quantity is to be awarded to L-1 bidder
      (iv) L-1 is "Non-MSE non-Class-l local supplier" - Purchase preference is to be given to MSEs as per PPP-MSE Order. Thereafter, purchase preference is to be given to Class-I local suppliers for "50% of the tendered quantity minus quantity allotted to MSEs above" as per PPP- Mll Order. For the balance quantity, contract is to be awarded to L-1 bidder. (Kindly refer to the illustrative example given at the end)
   c (b) Items covered under Para 3A(c) of PPP-Mll Order, 2017 are non-divisible items and both MSEs as well as Class-I local suppliers are eligible for purchase preference. Possible scenarios can be as under:
      (i) L-1 is "MSE Class-I local supplier" - Contract is awarded to L-1
      (ii) L-1 is not "MSE Class-I local supplier" but the "MSE Class-I local supplier" falls within 15% margin of purchase preference ..Purchase preference is to be given to lowest quoting "MSE Class-I local supplier". If lowest quoting "MSE Class-I local supplier" does not accept the L-1 rates, the next higher "MSE Class-I local supplier" falling within 15% margin of purchase preference is to be given purchase preference and so on
      (iii) If conditions mentioned in sub paras (i) and (ii) above are not met i.e. L-1 is neither "MSE Class-I local supplier" nor "MSE Class-I local supplier" is eligible to take benefit of purchase preference, the contract is to be awarded/ purchase preference to be given in different possible scenarios as under:
         A) L-1 is "MSE but non-Class-l local supplier" or "Non-MSE but Class-I local supplier" - Contract is be awarded to L-1
         B) L-1 is "Non-MSE non-Class-l local supplier" - First purchase preference to be given to MSE as per PPP-MSE Order. If MSE not eligible/ does not accept - purchase preference to be given to Class- I Local supplier as per PPP-Mll Order. If Class-I Local supplier also not eligible/ does not accept - contract to be awarded to L-1

d) *Items reserved for both MSEs and Class-I local suppliers:* These items are reserved exclusively for purchase from MSEs as well as Class-I local suppliers. Hence, only "MSE Class-I local supplier" are eligible to bid for these items. Non-MSEs/CIass-II local suppliers / Non-local suppliers cannot bid for these items. Hence the question of purchase preference does not arise.

e) Non-local suppliers, including MSEs falling in the category of Non-local suppliers, shall be eligible to bid only against Global Tender Enquiry.

Example explaining applicability in scenario explained in para 4 c (a)(iv)

(Scenario: Divisible items, both MSEs as well as Class-I local suppliers eligible for purchase preference and L-1 is "Non-MSE non-Class-l local supplier")

Item - Desktop computer.

Qty - 50 Nos.

Details of bids received

Sr. No.	Name of bidder	Rates quoted	Price Ranking	Status of bidder
1.	A	100	L1	Non-MSE non- Class-I local supplier"
2.	B	110	L2	"Non-MSE but Class-I local supplier"
3.	C	112	L3	"MSE but non- Class-I local supplier"
4.	D	115	L4	"Non-MSE but Class-I local supplier"
5.	E	118	L5	"MSE but non- Class-I local supplier"
6.	F	120	L6	"MSE Class-I local supplier"

1. In this case, first purchase preference is to be given to MSEs as per PPP-MSE Order for 25% of tendered quantity of 50 Nos. i.e. 12.5 Nos. (rounded off to the next whole number say 13 Nos). Accordingly, invite L3 (bidder C), whose quoted rates falls within 15% margin of purchase preference to match L-1 price i.e. ₹100 for quantity of 13 Nos. Bidder "E" and "F", although MSEs, will not get purchase preference since their quoted rates don't fall within 15% margin of purchase preference. Bidder C will be considered for order of 13 Nos. on confirmation of reduction of price.
2. For 50% of balance quantity of 37 number (tendered quantity of 50 - 13 awarded to bidder C; assuming bidder C has confirmed to accept L-1 rates), purchase preference will be given to lowest Class-I local supplier as per PPP-Mll Order. Accordingly, bidder B will be invited to match L-1 price for 50% of 37 Nos i.e. 18.5 (say 19 Nos of computers). If bidder "B" does not accept the L-1 price i.e. price of ₹100 per unit, next higher Class-I local supplier falling within 20% margin of purchase preference, i.e. bidder "D", may be invited to match L-1 price for 19 Nos. of computers and so on.
3. For remaining quantity i.e. 18 Nos (50-13-19), the contract will be awarded to lowest quoting bidder i.e. Bidder "A" who is L-1 in the example.

Annexure 6

Restrictions on Public Procurement from countries sharing land border with India

1. Any bidder from a country which shares a land border with India, excluding countries as listed on the website of the Ministry of External Affairs, to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects (hereinafter called 'Restricted Countries'), will be eligible to bid in any procurement whether of Goods, Services (including Consultancy Services and Non-Consultancy Services) or Works (including Turnkey Projects) only if the bidder is registered with the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT). Bidders shall enclose the certificate in this regard in Section XVIII – Eligibility Declarations.
2. Further, any bidder (including bidder from India) having specified Transfer of Technology (ToT) arrangement with an entity from a country which shares a land border with India, shall also require to be registered with the same Competent Authority.
3. In Bids for Turnkey contracts, including Works contracts, the successful bidder shall not be allowed to sub-contract works to any contractor from such Restricted Countries unless such contractor is similarly registered. In such cases, bidders shall enclose the certificate in this regard in Section XVIII – eligibility declarations.
4. If Bidder has proposed to sub-contract Services or incidental Goods directly/ indirectly from the vendors from such countries, such vendor shall be required to be registered with the Competent Authority. However, if Bidder procures raw material, components, and sub-assemblies from such countries' vendors, such vendors shall not require registration.
5. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.
6. "Tender" will include other forms of procurement, except where the context requires otherwise.
7. "Bidder from a country which shares a land border with India" means: -
   a) An entity incorporated, established or registered in such a country; or
   b) A subsidiary of an entity incorporated, established or registered in such a country; or
   c) An entity substantially controlled through entities incorporated, established or registered in such a country; or
   d) An entity whose *beneficial owner* is situated in such a country; or
   e) An Indian (or other) agent of such an entity; or
   f) A natural person who is a citizen of such a country; or
   g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above
8. The *beneficial owner* for the purpose of 4 above will be as under:
   i) In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means. Explanation—
      a) "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent of shares or capital or profits of the company;
      b) "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholder agreements or voting agreements;
   ii) In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;
   iii) In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;
   iv) Where no natural person is identified under (i) or (ii) or (iii) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;
   v) In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.
9. An "Agent" is a person employed to do any act for another, or to represent another in dealings with third person.
10. *[To be inserted in tenders for Works contracts, including Turnkey contracts]* The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority. The definition of "contractor from a country which shares a land border with India" shall be as in paragraph 4 above.
11. The Registration shall be valid at the time of submission of bid and at the time of acceptance of bid. If the bidder was validly registered at the time of acceptance/ placement of order, registration shall not be relevant consideration during contract execution.

Model Certificate for Tenders

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

Model Certificate for Tenders for Works involving possibility of sub-contracting

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

Model Certificate in cases of specified ToT

I have read the clause regarding restrictions on procurement from a bidder having Transfer of Technology (ToT) arrangement with an entity from a country which shares a land border with India; I certify that this bidder does not have any ToT arrangement requiring registration with the Competent Authority.

OR

I have read the clause regarding restrictions on procurement from a bidder having Transfer of Technology (ToT) arrangement with an entity from a country which shares a land border with India. I certify that this bidder have valid registration to participate in this procurement.

Annexure 7

Bid Securing Declaration
(on Company Letter-head)

Bid Securing Declaration In lieu of EMD/Bid security is to be submitted as part of Technical bid in the following format. Bidders exempted from submission of EMD/Bid Security are also required to submit this.

Bidder's Reference No._____ Date: _____

To
The Chief General Manager
Bharatiya Reserve Bank Note Mudran Private Limited
Corporate Office
Bengaluru - 560029

Ref: e-Tender Enquiry No. 008/CO/OT/2023-24 dated February 29, 2024

Sir,

We, the undersigned, solemnly declare that:

We understand that according to the conditions of this Tender Document, the bid must be supported by a Bid Securing Declaration in lieu of Bid Security.

We unconditionally accept the conditions of this Bid Securing Declaration. We understand that we shall stand automatically suspended from being eligible for bidding in any tender in BRBNMPL for 1 year from the date of opening of this bid if we breach our obligation(s) under the tender conditions if we:

1) withdraw/amend/impair/derogate, in any respect, from our bid, within the bid validity; or
2) being notified within the bid validity of the acceptance of our bid by the Procuring Entity:
    a) refused to or failed to produce the original documents for scrutiny or the required Performance Security within the stipulated time under the conditions of the Tender Document.
    b) Fail or refuse to sign the contract.

We know that this Bid-Securing Declaration shall expire if the contract is not awarded to us, upon:

1) receipt by us of your notification
    a) of cancellation of the entire tender process or rejection of all bids or
    b) of the name of the successful bidder or
2) forty-five days after the expiration of the bid validity or any extension to it.

(Signature with date)

……..
(Name and designation)
Duly authorized to sign bid for and on behalf of……..
[name & address of Bidder and seal of company]
Dated on …….. day of …….. [insert date of signing]
Place…… [insert place of signing]

Annexure 8

Template for assessment of capability of Bidder
(To be submitted as part of Technical bid on Company Letter-head)

Bidders should furnish statements and documents confirming their Capability to manufacture the Goods. The list below is indicative only. Bidders may attach more documents as required. Additional details not covered elsewhere in the bid may also be added.

Bidder's Reference No._____ Date_____

To
The Chief General Manager
Bharatiya Reserve Bank Note Mudran Private Limited
Corporate Office
Bengaluru - 560029

Ref: e-Tender Enquiry No. 008/CO/OT/2023-24 dated February 29, 2024

1) Location of the manufacturing Factory
2) Details of Plant and Machinery executed and function in each department (Monographs & description pamphlets) be supplied, if available.
3) Details of arrangement for quality control of products such as laboratory etc.
4) Details of Technical Supervisory staff-in-charge of production and quality control
   a) Skilled labour employed.
   b) Unskilled labour employed.
   c) The maximum number of workers (skilled & unskilled) employed on any day during the 18 months preceding the date of application.
5) Installed production capacity of item(s) quoted for, with the existing plant and machinery.
   a) The installed monthly production capacity for _____ and the type of _____
   b) What portion of the production capacity shall be reserved for this contract? Indicate reserved capacity in terms of the number of items of Goods per month.
   c) average monthly production of _____ during the last 5 years on a single shift basis
   d) Existing order on hand for _____
6) Have you supplied the Goods tendered for or other identical items in the past? If so, details of supplies in the last five years may be furnished.

……..
(Signature with date)

……..
(Name and designation)
Duly authorized to sign bid for and on behalf of

……..
[name & address of Bidder and seal of company]

Annexure 9

Performance Statement

(Statement of ~~Supplies~~ Works During Last ~~Five~~ Seven Years and Outstanding Current Orders)

(To be submitted as part of Technical bid)

Bidders should Fill up this Form their past performance highlighting their qualification to ~~supply relevant Goods~~ perform tendered / Similar Works. Statements and Documents to the Performance Statement may be mentioned/attached here. The list below is indicative only. Bidders may attach more documents as required to showcase their past performance. Additional details not covered elsewhere in the bid may also be added.

Bidder's Reference No._____ Date_____

To
The Chief General Manager
Bharatiya Reserve Bank Note Mudran Private Limited
Corporate Office
Bengaluru - 560029

Ref: e-Tender Enquiry No. 008/CO/OT/2023-24 dated February 29, 2024

Sl. No.	Description of Work	Location of Work	Client Address and contact details including email	~~P.O.~~ W.O. No. and dated	~~Quantity~~ Value of Contract awarded	Period of Contract (From – To date)	Date of Completion	~~Quantity~~ Value of Contract Completed	Rem arks
	Total				**XXXX**			**XXXX**	

……..
(Signature with date)

……..
(Name and designation)

Duly authorized to sign bid for and on behalf of

……..
[name & address of Bidder and seal of company]

Annexure 10

Statement of Financial Standing

Auditee Details:

……..

……..

Sl. No.	Financial Year	Annual Turnover	Net Worth	Remarks
1.	2020-21			
2.	2021-22			
3.	2022-23			

……..
Signature of Certified Accountant

Name :

Name of Firm :

Reg. No of Firm :

Membership No :

UDIN No. :

Place :

Date :

Note for bidders

i. This statement is to be submitted by bidders who are **not** required to submit audited books of accounts.

ii. Submission of audited books of accounts bearing valid UDIN is required for firms whose sales, turnover or gross receipts is more than ₹1 crore. However, for firms whose cash receipts are limited to 5% of the gross receipts or turnover, and whose cash payments are limited to 5% of the aggregate payments, the threshold limit of ₹1 crore for tax audit is increased to ₹10 crore with effect from AY 2021-22 (FY 2020-21).

iii. Firms whose sales, turnover or gross receipts is less than ₹1 crore, submission of audited books of accounts is not necessary. However, such firms have to submit a Statement of Financial Standing in the above format bearing a valid UDIN along with the bid in order to ensure the compliance of the bidder against the financial standing criteria.

iv. This statement has to be certified by a certified accountant e.g. Chartered Accountant (CA) in India with valid UDIN and Certified Public Accountants / Chartered Accountants / Members of Certified Accounting Body of the government of the Bidder's country in case of foreign bidders.

Annexure 11

NEFT Mandate Form

(Customer's option to receive payments through Credit Clearing Mechanism)

1	Investor / Customer's Name		
2	Particulars of Bank account		
	A	Name of the Bank	
	B	Name of the branch	
		Address	
		Telephone No	
		Whether Bank branch is NEFT enabled	
	C	Code number of the bank and branch appearing on the MICR Cheque issued by the bank	
	D	Type of the account (SB, Current or Cash Credit)	
	E	Ledger and Ledger Folio number	
	F	**Account number** (as appearing on the Cheque book)	
	G	**RTGS / IFSC Code No.**	
	(In lieu of the bank certificate to be obtained as under, please attach a blank cancelled cheque or photocopy of a cheque or front page of your Savings bank passbook issued by your bank for verification of the above particulars)		
3	Date of effect		

I hereby declare that the particulars given above are correct and complete. If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold the user institution responsible. I have read the option invitation letter and agree to discharge the responsibility expected of me as a participant under the scheme.

(……)

Date: Signature of the Customer

Certified that the particulars furnished above are correct as per our records

Bank's Stamp

(……)

Signature of the authorized

Date: official of the Bank

Annexure 12

Terms and Conditions - Compliance
(To be submitted as part of Technical bid in e-Procurements)
(on Company Letter-head)

Bidder's Reference No._____ Date_____

To
The Chief General Manager
Bharatiya Reserve Bank Note Mudran Private Limited
Corporate Office
Bengaluru - 560029

Ref: e-Tender Enquiry No. 008/CO/OT/2023-24 dated February 29, 2024

Sir/Madam,

a) We have gone through entire tender document thoroughly. We hereby submit this 'Terms and Conditions – Compliance' as token of acceptance of all the terms and conditions mentioned in following Sections and Annexures of the tender.

1. Section I : Notice Inviting Tender (NIT)
2. Section II : General Instructions to Tenderers (GIT)
3. Section IV : General Conditions of Contract (GCC)
4. Section IX : Qualification Criteria
5. Section XIII : Bank Guarantee Form for EMD
6. Section XV : Bank Guarantee Form for Performance Security
7. Section XVI : Contract Form
8. Section XIX : Proforma of Bills for Payments
9. Annexure 1 to 5 : Explanatory Note on Make in India Order 2017; MSEs Order 2012 and Start-ups
10. Annexure 6 : Restrictions on Public Procurement from countries sharing land border with India

b) We confirm that we shall comply with, abide by, and accept without variation, deviation, or reservation, all terms & conditions of the Tender Document and we have no counter-conditions.

c) We confirm that on being successful in tender, we would perform the Works exactly as per Scope of Work (Section VII) and all other terms and Conditions of the Tender.

d) We understand that for any false declaration and submission of any untrue documents in the tender, our offer will be liable for rejection /cancellation of order/subjected to appropriate actions as per tender Terms & Conditions.

e) We understand that originals (or self-attested copies of originals – as specified therein) of specified scanned uploaded documents (except Price Schedule) must be physically submitted in a sealed cover before the bid submission deadline at mentioned venue. ***Failure to do so is likely to result in the bid being rejected.***

(Signature with date)

……..
(Name and designation)

Duly authorized to sign bid for and on behalf of……..
[name & address of Bidder and seal of company]

Dated on …….. day of …….. [insert date of signing]

Place…… [insert place of signing]

Annexure 13

Undertaking to provide financial support to our wholly owned subsidiary
(On the letter head of the holding company)

Ref.: _____ Date: _____

To
The Chief General Manager
Bharatiya Reserve Bank Note Mudran Private Limited
Corporate Office
Bengaluru - 560029

Dear Sir,

Undertaking to provide financial support to our wholly owned subsidiary

We, _____ agree to provide financial support to our wholly owned subsidiary, _____ (**"Bidder"**), who is participating in the tender floated by you bearing no. 008/CO/OT/2023-24 dated February 29, 2024 for the Work of Renovation of Corporate Office Building at BRBNMPL, Bengaluru (**"Tender"**).

We confirm and undertake that our financial standing credentials can be clubbed with that of the Bidder in order to enable it to qualify the financial standing criteria stipulated in the Tender documents. We enclose the necessary documents to enable you to assess and confirm our financial standing.

We further agree and undertake to furnish to you a suitable performance bank guarantee and indemnify you and hold you harmless in the event the Bidder fails to perform its obligations under the Tender.

We, hereby, undertake to make available to the Bidder the required financial resources to enable compliance by the Bidder with the Tender and the contract that may be awarded pursuant to the bid, if successful.

For and on behalf of _____

.....

Enclosures:

1. Copy(s) of our Certificate of Incorporation and that of the Bidder;
2. Copy(s) of Form MGT-7 (i.e., Annual Return) filed by us and the Bidder for the latest financial year;
3. Copy of our Permanent Account Number Card;
4. Copy(s) of our Consolidated Financial Statement for the last three financial years
5. Copy of shareholders agreement, if any
6. Copy of Memorandum and Articles of Association/Partnership deed of bidding entity.

Annexure 14

Check-List for Bidders

(The following check-list may be made a part of the SBD; to be submitted by the bidder as part of technical Bid)

This check-list is merely to help the bidders to prepare their bids; it does not over-ride or modify the requirement of the tender. Bidders must do their own due diligence also.

Sl. No.	Documents submitted, duly filled, signed		Yes / No / NA
1	Section X - Tender Form (to serve as covering letter and declarations applicable for both the Techno-commercial bid and Financial bid)		
2	Section XII - Bidder Information along with Power of attorney and Registration Certificates etc., if asked		
	(a)	Self-attested copy of Registration certificates etc. of the firm, if asked	
	(b)	Self-attested copy of PAN	
	(c)	Self-attested copy of GSTIN registration(s)	
	(d)	Self-attested copy of Provident Fund	
	(e)	Self-attested copy of Professional Tax Registration (with latest Professional Tax paid receipt)	
	(f)	Self-attested copy of ESI/WC/Any other Insurance	
	(g)	Self-attested copy of Power of Attorney etc. authorizing signatories on stamp paper to sign the bid, if asked	
3	Section XVIII - Eligibility Declarations, along with supporting documents		
	(a)	Self-attested copy of Registration certificate for bidders / subcontractors from restricted neighbouring countries	
	(b)	Self-attested copy of MSME registration	
	(c)	Self-attested copy of Start-up registration / status	
	(d)	Self-attested copy of the certificate of Local Supplier status for Make in India policy, from auditors / cost accountant in case of Tenders above ₹10 Crore, if applicable	
4	Section XIV - OEM's Authorization Form duly filled up (if applicable to Bidder concerned)		
	(a)	Self-attested copy of Registration certificates etc. of the OEM/principal, if asked	
	(b)	Self-attested copy of Power of Attorney etc. authorizing signatories on stamp paper to sign Section XIV of OEM / Principal, if asked	
5	Section VI - List of Requirements - Compliance		
6	Section VII – Scope of Work - Compliance		
	(a)	Relevant documents like technical data, literature, drawings, and other documents, at the option of Bidder	
7	Section VIII - Quality Control Requirements - Compliance		

Sl. No.	Documents submitted, duly filled, signed		Yes / No / NA
8	Proof of submission of EMD, if applicable		
	(a)	Type of instrument - DD/BC/NEFT/RTGS/BG/Other Electronic Modes using UPI id/UPI QR code, at the option of bidder	
	(b)	Instrument scan uploaded, if applicable	
	(c)	Instrument details, as applicable • Drawn on Bank, Branch, Valid up to, for DD/Banker's cheque • Transaction No. for NEFT/RTGS/Other Electronic Modes (UPI) • No. with Date, Issuing Bank details, for Bank Guarantee • No. with Date, Insurer details, for Insurance Surety Bond	
	(d)	Bid Securing Declaration, for exempted bidders (Annexure 7)	
9	Conformity with capability criteria (Annexure 8), if applicable		
	(a)	Documents attached supporting conformance to capability criteria, if applicable	
10	Performance Statement (Annexure 9)		
	(a)	Documents / contracts supporting the performance statement	
11	Statement of Financial Standing (Annexure 10)		
	(a)	Audited Balance Sheet and Profit & Loss Statement	
12	NEFT Mandate Form (Annexure 11)		
	(a)	Cancelled cheque in lieu of Bank endorsement, at the option of bidder	
13	Terms and Conditions – Compliance (Annexure 12)		
	(a)	Documents, if any, at the option of Bidder	
14	Undertaking to provide financial support to our wholly owned subsidiary, if applicable (Annexure 13)		
15	This Checklist (Annexure 14)		
16	Section XX - Duly signed Integrity Pact, If applicable		
17	Financial Bid (To be submitted online)		
18	Any other requirements, if stipulated in the tender; or if considered relevant by the Bidder		

……..
(Signature with date)

……..
(Name and designation)

Duly authorized to sign bid for and on behalf of

……
[name & address of Bidder and seal of company]