



STATE BANK OF INDIA

LOCAL HEAD OFFICE,
III/1, Pt. J. N. MARG
BHUBANESWAR

TENDER NO. AO/BAM/2024-25/11

DATE: 31.12.2024

Part – I (Technical Bid)

NOTICE INVITING e-TENDER

**TENDER DOCUMENT FOR ADDITION, ALTERATION & CONSTRUCTION,
OF G+1 STORIED BUILDING FOR RSETI RAYAGADA ODISHA.
COMPOSITE WORK: CIVIL, PH, & ELECTRICAL (LT) WORK**

Name of the Tenderer : _____

Address : _____

Date & Time of Opening of Tender: 15.01.2025 at 4:00 pm.

M/s DESIGNERS FORUM

**N-2/64, IRC VILLAGE,
Bhubaneswar-751015, Ph-0674-2558056,
9437008001
E- mail: designersforum@gmailcom**

Eligibility Criteria: Contractors/Vendors empaneled in Bhubaneswar Circle under the category CB (above 100 lakhs up to 300 lakhs are eligible to apply). Vendor/Contractor should possess valid digital signature for this e-tender

Notice Inviting Tender (e-NIT)
WORK: Addition, Alteration & Construction of G+1 Storied Building for RSETI
Rayagada, Odisha

SBI, LHO, Lead Bank & RSETI Department invites online item rate E- Tenders for the captioned work from Contractors/Vendors empaneled in Bhubaneswar Circle under the category Civil work :CB (above 100 lakhs up to 300 lakhs) meeting the eligibility mentioned as under. The other details of the tender are as under:

1.	Name of Work	Addition, Alteration & Construction of G+1 Storied Building for RSETI Rayagada, Odisha
2	Eligibility criteria	Contractors/Vendors empaneled in the category " CB (above 100 lakhs up to 300 lakhs) under Bhubaneswar Circle, are eligible to apply.
3	Estimated cost put to tender	Rs.1,85,71,954.00 (Rupees One Crores Eighty Five Lakhs Seventy One Thousand Nine Hundred Fifty Four Only) excluding GST
4	Time of Completion	12 (Twelve) Calendar Months from the date of handover of site to the Contractor.
5	Earnest Money Deposit (EMD)	<p>Rs.1,86,000.00 (Rupees One Lakh Eighty Six Thousand Only) in the form of Demand Draft/Banker's Cheque issued by any Nationalised /Scheduled Bank Drawn in favour of "State Bank of India." Payable at Bhubaneswar". The EMD shall be submitted to SBI, LHO, III/1, Pt. J. N. Marg, Bhubaneswar, in a separate envelope super scribing "EMD.</p> <p>Contractors deposited one time EMD in SBI LHO Bhubaneswar Premises Department are exempted from submitting EMD and required to attach scan copy of FD.</p> <p><u>Vendors having NSIC/ MSME certificates are not required to submit the EMD. Scan copy of Registration Certificate shall be submitted However, no exemption shall be entertained towards Initial security deposit (ISD) as per T&C of the contract.</u></p>
6	Security Deposit	5% of the final bill value.
7	Availability of Tender document.	Contractor should download Tender documents from 31.12.2024 up to 3:00 PM on 15.01.2025 from e-Tender portal www.tenderwizard.com / SBI ETENDER or Bank's website www.sbi.co.in <link> SBI in the News>Show More>Procurement. But the bidder need to submit digitally signed copy on-line only in the e-tendering portal only.

8	Last date, time, and place for submission of Online Technical Bid.	<p>The eligible vendors/ contractors are required to submit the scan copies of following documents on-line on service provider portal i.e. www. tenderwizard.com, on or before</p> <p>Dt. 15.01.2025 up to 03:00 PM.:</p> <p>i) Payment receipt of the Tender processing fee, if any.</p> <p>ii) Earnest Money Deposit (EMD).</p> <p>iii) Process Compliance form (Annexure-I) in company letterhead duly signed and stamped by authorized representative.</p> <p>iv) Letter of Undertaking in company letterhead duly signed and stamped by authorized representative.</p> <p><u>The scan copy of the EMD and technical bid digitally signed are to be submitted online on or before 15.01.2025 up to 03:00 PM. However, the EMD DD (original) need to be submitted physically at the aforesaid address on or before due date.</u></p> <p><u>The SBI shall not entertain EMD received late due to any delay on account of delivery by the courier agency/speed post or any other mode for the reasons whatsoever. Tenders received without any one or more documents mentioned above shall be rejected.</u></p> <p>The technical bid and price bid shall be submitted online only. Price bid of technically qualified vendors will be opened online.</p>
9	Last date, time and Mode of submission of Online Price Bid	The Price Bid to be uploaded/submitted online on service provider portal i.e. www. tenderwizard.com / SBI ETENDER on or before the 3:00 PM of 15.01.2025 as notified in the e-tendering port
10	For any details contact: E-Tendering Agency	Kushal Bose Antares Systems Ltd. Mob.+91 7686913157 Email: kushal.b@antaressystems.com
11	Date, Time, and Place of opening of Technical Bid.	Technical bid (Part-I): After 4.00 PM on 15.01.2025 at the Office of AGM (Lead Bank & RSETI), 4th Floor, OSCARD Bank building, Kharvelnagar, Bhubaneswar-751001.
12	Date, Time, and Place of the opening of Online Price	Price bid (Part-II): After 4.30 PM on 15.01.2025 , at the Office of AGM (Lead Bank & RSETI), 4th Floor, OSCARD Bank building, Kharvelnagar, Bhubaneswar-751001.

	Bid.	The contractor/ vendor can view the Tender opening details through their respective log in Ids on the above-mentioned e-tender portal (Website).
13	Defect Liability Period	1 year from the date of issue of virtual completion certificate
14	Validity of Offer	90 days from the date of opening of the Price-Bid
15	Commencement of work.	As advised in the Work Order.
16	Liquidated Damages (LD)	LD shall be imposed at the rate 0.5 % Per week for delay subject to maximum amount of 5% of the accepted Contract/ final work Value.
17	Terms and Mode of payment	<p>i) No advance/mobilization payment will be entertained.</p> <p>ii) The interim/running payment of Rs.30.00 Lakhs will be entertained subject to execution of works.</p> <p>iii) After successful completion of entire work balance or 100% payment will be released against submission of tax invoice and work completion certificates.</p> <p>iv) Payment shall be made by way of Electronic fund transfer and the bill will be paid by the SBI. Firm should furnish details of the bank, A/c no, IFSC code.</p> <p>v) Any Tax invoice raised to the Bank, should bear the GST Number 21AAACS8577K1Z1 of State Bank of India for Bhubaneswar LHO.</p>
18	Contact Person for sending any kind of correspondence regarding this tender	<p>For any Technical queries:</p> <p>Architect's side: Mr. Satya Prakash-9437853081 M/s Designer Forum, Bhubaneswar</p> <p>Bank's side: Sri Tapan Kumar Sahoo, AGM (LB & RSETI)-9337216003, Sri Nilanchala Pradhan, CM (LB & RSETI)-9766634038, Sri Amit Mohanty, Manager (Civil)-9449524076, Sri B V Pratap Dy. Manager (Elect)-9937337964 Email: agmlb.lhobhu@sbi.co.in</p>

- In case the date of opening of tenders is declared as a holiday, the tenders will be

opened on the next working day at the same time.

- The bidder, who is the authorized representative and participating on behalf of company/ Contractor/vendor, should have a valid digital signature certificate (DSC) for this tender. The validity of the DSC should be at least 3 months.
- **Eligibility Criteria:** Contractors/Vendors empaneled in Civil work category: CB (work value above 100 lakhs up to 300 lakhs) under SBI Bhubaneswar Circle, are eligible to apply.
- **The contractor/vendor/firm who is awarded the work shall possess valid Electrical license OR need to engage SBI empaneled electrical contractor of min. work value 25 Lakhs or above in HT/LT category under Bhubaneswar Circle to execute electrical work as per the BOQ with prior permission from the Bank.**
- The process of online re-bidding amongst two or more contractors offering same rates shall continue till L-1 bidder is discovered.
- In case, any of such contractor(s) (quoted same tender amount during initial bidding or subsequent rebidding) refuses to submit revised offer, it shall be treated as "withdrawal of tender" by the Contractor before acceptance. The earnest money of such contractors shall be forfeited and the bidder shall not be eligible to participate in retender event
- The Contractor(s), whose earnest money is forfeited because of non-submission of revised offer, shall not be allowed to participate in the re-tendering process for the said project.
- SBI reserves the right to increase or decrease the quantum of items, services, manpower to be provided and also reserves the right to reject, cancel or revise or accept any or all the tenders or part of tenders without giving any reasons thereto.
- SBI reserves its rights to accept/reject any/all tender without assigning any reasons whatsoever and to increase or decrease the quantities of any item and contractor has to execute the same at the rate quoted and no correspondence shall be entertained in this regard.
- The L-1 Vendor (successful bidder) shall sign and stamp each page of the tender document thereby ensuring the number and sequence of all pages after completion of the tendering procedures.
- Conditional tenders are liable for rejection.

M/s Designers Forum
(For and behalf of AGM LB & RSETI)
SBI, LHO, Bhubaneswar

INSTRUCTIONS TO THE TENDERERS

1.0 Scope of Work

Sealed Tenders are invited by M/s Designers Forum, project architect for and behalf of State Bank of India for the work of **Addition, Alteration & Construction of G+1 Storied Building for RSETI Rayagada, Odisha**

1.1 Site and Its Location

Bank intends to construct G+1 storied building having total built up area of approx. 4121 Sqft on the adjacent side of existing building and addition, alteration work of existing building measuring approx. 4013 Sqft areanincluding allied PH & electrical work at Anjiyapeta Near Fishery Office Street, No 15-C, Mouza- Jayaramguda, P O- J S Co, Rayagada- 765002

2.0 Tender Documents

2.1 The work has to be carried out strictly according to the conditions stipulated in tender consisting the following documents and the most workman like manner,

- Instructions to tenderers
- General Conditions of Contract
- Special Conditions of Contract
- Additional Conditions for Electrical Installation
- Additional conditions for firefighting Systems
- Technical Specifications
- Drawings
- Priced Bid

2.2 The above documents shall be taken as complementary and mutually explanatory of one another but in case of ambiguities or discrepancies, shall take precedence in the order given below:

- Price Bid
- Technical Specifications
- Additional Conditions for Electrical Installation
- Special Conditions of Contract
- General Conditions of Contract
- Instructions to Tenderers

2.3 Complete set of tender documents including relative drawings if any can be downloaded from e-Tender portal **www. tenderwizard.com / SBI ETENDER or** Bank's website www.sbi.co.in<link>SBI in the News>Show More>Procurement.

2.4 The tender documents are not transferable.

3.0 Site Visit

3.1 The tenderer must obtain himself on his own responsibility and his own expenses all information and data which may be required for the purpose of filling this tender document and enter into a contract for the satisfactory performance of the work. The Tenderer is requested satisfy himself regarding the availability of water, power, transport and communication facilities, the character quality and quantity of the materials, labour, the law & order situation, climatic conditions lo-

cal authorities requirement, traffic regulations etc. The tenderer will be fully responsible for considering the financial effect of any or all the factors while submitting his/her tender.

4.0 Earnest Money

The tenderers are requested to submit the Earnest Money of aforesaid amount in the form of Demand

4.1 Draft or Banker's Cheque in favour of State Bank of India as mentioned in NIT

4.2 EMD in any other form other than as specified above will not be accepted. Tender not accompanied by the EMD in accordance with clause 4.1 above shall be rejected.

4.3 No interest will be paid on the EMD.

4.4 EMD of unsuccessful bidders will be refunded within 30 days of award of Contract.

4.5 EMD of successful tenderer will be retained as a part of security deposit.

5.0 Initial Security Deposit

The successful tenderer will have to submit a sum equivalent to 2% of contract value less EMD by means of D/D drawn in favour of State Bank of India within a period of 15 days of acceptance of tender.

6.0 Security Deposit

6.1 Total security deposit shall be 5% of contract value. Out of this 2% of contract value is in the form of initial security deposit which includes the EMD. Balance 3% shall be deducted from the running account bill of the work at the rate of 10% of the respective running account bill i.e. deduction from each running bill account will be 10% till total 3% of contract value is reached. 50% of the total security shall be paid to the contractors on the basis of architect's certifying the virtual completion. The balance 50% would be paid to the contractors after the defects liability period as specified in the contract.

6.2 No interest shall be paid to the amount retained by the Bank as Security Deposit.

6.3 Additional Security Deposit:- Additional Security deposit (ASD)/Additional performance Guarantee (APG) shall be applicable if the bid price is below 7.5 % of the estimated cost put to tender. The amount of such ASD/ APG shall be the difference between 92.5 % of estimated cost put to tender and the quoted price.

7.0 Signing of Contract Documents

The successful tenderer shall be bound to implement the contract by signing an agreement and conditions of contract attached herewith within 15 days from the receipt of intimation of acceptance of his tender by the Bank. However, the written acceptance of the tender by the Bank will constitute a binding agreement between the Bank and successful tenderer whether such formal agreement is subsequently entered into or not.

8.0 Completion Period: The time period allowed for completion of the project shall be **Twelve (12) months** from the date of commencement of work or 15 days from the date of issuance of work order, whichever is earlier.

9.0 Validity of Tender

Tenders shall remain valid and open for acceptance for a period of 3 (Three) months from the date of opening price bid. If the tenderer withdraws his/her offer during the validity period or makes modifications in his/her original offer which are not acceptance to the Bank without prejudice to any other right or remedy the Bank shall be at liberty to forfeit the EMD.

10.0 Liquidated Damages

The liquidated damages shall be 0.5% per week subject to a maximum of 5% of contract value.

11.0 Rates and Prices : Item rate based tender

The tenderers shall quote their rates for individual items both in words and figure. In case of discrepancy between the rate quoted in words and figures, the unit rate quantity in words will prevail. The amount of each item shall be calculated and the requisite total is given. In case of discrepancy between the unit rate and the total amount calculated from multiplication of unit rate and the quantity the unit rate quoted will govern and the amount will be corrected.

If no rate is quoted for one or more tender items, such tenders shall be treated as

Non-Responsive Tenders and the same shall be summarily rejected.

11.1.1 The tenderers need not quote their rates for which no quantities have been given. In case the tenderers quote their rates for such items those rates will be ignored and will not be considered during execution.

11.1.2 The tenderers should not change the units as specified in the tender. If any unit is changed the tenders would be evaluated as per the original unit and the contractor would be paid accordingly.

The tenderer should not change or modify or delete the description of the item. If any discrepancy is observed he/she should immediately bring to the knowledge of the Architect/ Bank.

11.1.3 The rate quoted shall be firm and shall include all costs, allowances, transportation, taxes, cess, royalties, levies, excluding GST etc.

E-TENDERING INSTRUCTIONS TO BIDDERS**BUSINESS RULES & TERMS AND CONDITIONS FOR E-TENDER****General Conditions**

1. For the proposed online bidding, already empanelled vendors with SBI under appropriate category who fulfil all terms and conditions including deposit of earnest money and tender processing fee only shall be eligible to participate.
2. SBI will engage the services of a service provider who will provide all necessary training and assistance before commencement of online bidding on Internet.
3. SBI will inform the vendor in writing in case of online bidding, the details of service provider to enable them to contact and get trained.
4. Business rules like event date, time, start price, bid decrement, extensions, etc. also will be communicated through service provider for compliance.
5. Vendors have to fax / email the compliance form in the prescribed format (provided by service provider) before start of online bidding. Without this the vendor will not be eligible to participate in the event.
6. Opening of online bids will be conducted on schedule date & time.
7. At the end of online bidding event, the lowest bidder value will be known on the network.
8. The lowest bidder has to fax the duly signed filled-in prescribed format as provided on case-to case basis to SBI through service provider within 24 hours of completion of tender without fail.
9. Any variation between the on-line bid value and signed document will be considered as sabotaging the tender process and will invite disqualification of vendor to conduct business with SBI as per prevailing procedure.
10. In case SBI decides not to go for online bidding on procedure for this tender enquiry, the price bids and price impacts, if any already submitted and available with SBI shall be opened as per SBI standard practice.

Business Rule for finalization of the Tender

1. SBI shall finalize the tendering process of the item through online bidding mode. SBI has made arrangement with M/s Antares Systems Ltd,(e-Tendering Agency (ETA) who shall be SBI's authorized service provider for the same. Please go through the guidelines given below and submit your acceptance to the same along with your Commercial Bid.
2. Computerized online tendering shall be conducted by SBI, on pre-specified date, while the vendors shall be quoting from their own offices/ place of their choice. Internet connectivity and other paraphernalia requirements shall have to be ensured by vendors themselves. In the event of failure of their Internet connectivity, (due to any reason whatsoever it may be) it is the bidders responsibility / decision to send fax communication, immediately to ETA furnishing the price, the bidder wants to bid online, with a request to ETA to upload the faxed price on line so that the service provider will up load that price on line on behalf of the Bidder. It shall be noted clearly that the concerned bidder communicating this price to service provider has to solely ensure that the fax message is received by ETA in a readable / legible

form and also the Bidder should simultaneously check up with ETA over phone about the clear receipt of the price faxed. It shall also be clearly understood that the bidder shall be at liberty to send such fax communications of prices to be uploaded by ETA only before the closure of Bid time and under no circumstances it shall be allowed beyond the closure of bid time. Such bidders have to ensure that the service provider is given a reasonable required time by the bidders, to upload such faxed prices online and if such required time is not available at the disposal of ETA at the time of receipt of the fax message from the bidders, ETA will not be uploading the prices. It is to be noted that either SBI or ETA are not responsible for these unforeseen circumstances. In order to ward-off such contingent situation, bidders are requested to make all the necessary arrangements / alternatives wherever required so that they are able to circumvent such situation and still be able to participate in the online bidding successfully. However, the vendors are requested not to wait till the last moment to quote their bids to avoid any such complex situations.

3. ETA shall arrange to train your nominated person(s), without any cost to you. They shall also explain you, all the Rules related to the Tendering/ Business Rules Document to be adopted along with bid manual. You are required to give your compliance on it before start of bid process.

4. **BIDDING CURRENCY AND UNIT OF MEASUREMENT:** Bidding will be conducted in item wise rates quoted in Indian Rupees (INR) per -one- (Unit) of the items as mentioned in Price Bid/ BOQ.

5. **BID PRICE:** The Bidder has to quote their rates for individual items both in words and figure at which bidder is willing to execute the work inclusive of all taxes, duties, freight, service tax, overhead, contractor's profit etc. excluding GST. GST shall be paid extra as per actual. In case of discrepancy between the rate quoted in words and figures, the unit rate quantity in words will prevail. The amount of each item shall be calculated and the requisite total is given. In case of discrepancy between the unit rate and the total amount calculated from multiplication of unit rate and the quantity the unit rate quoted will govern and the amount will be corrected. If no rate is quoted for one or more tender items, such tenders shall be treated as Non-Responsive Tenders and the same shall be summarily rejected.

6. **VALIDITY OF BIDS:** The Bid price shall be firm for a period of three calendar months from the date of acceptance of tender which may be extended for a further period subject to mutual agreement.

7. The bidder has to submit a detail break up for his commercial offer in the prescribed format as given by the Bank duly signed by their authorized representative/proprietor.

8. Your bid will be taken as an offer to supply. Bids once made by you, cannot be cancelled / withdrawn and you shall be bound to supply as mentioned above at your final bid price. In case you back out and not execute the work as per the rates quoted, the earnest money deposited by you retained by us in this regard shall be forfeited without further reference to you.

9. You shall be assigned a Unique Username & Password by ETA. You are advised to change the Password after the receipt of initial Password from ETA to ensure confidentiality. All bids made from the Login ID given to you will be deemed to have been made by your company.

10. At the end of the online Tendering process, SBI will decide the successful bidder. SBI's decision on award of Contract shall be final and binding on all the Bidders.

11. SBI shall be at liberty to cancel the tender at any time, before ordering, without assigning any reason, there to.

12. SBI shall not have any liability to bidders for any interruption or delay in access to the site irrespective of the cause.

13. Other terms and conditions shall be as per your techno-commercial offers and other correspondences till date.

14. You are required to submit your acceptance to the terms / conditions / modality given above before participating in the online bidding.

15. Successful bidder shall enter into a contract with the bank to carry out the work as per Bank's standard format.

16. OTHER TERMS & CONDITIONS: - The Bidder shall not involve himself or any of his representatives in Price manipulation of any kind directly or indirectly by communicating with other suppliers / bidders. - The Bidder shall not divulge either his Bids or any other exclusive details of SBI to any other party. - SBI's decision on award of Contract shall be final and binding on all the Bidders. - SBI along with ETA can decide to extend, reschedule or cancel any tender. Any changes made by SBI and / or ETA, after the first posting will have to be accepted if the Bidder continues to access the site after that time. ETA shall not have any liability to Bidders for any interruption or delay in access to the site irrespective of the cause. - ETA is not responsible for any damages, including consequential damages, including but not limited to systems problems, inability to use the system, loss of electronic information etc.

N.B. - All the bidders are requested to ensure that they have a valid digital certificate well in advance to participate in the online event - All the Bidders are required to submit the Agreement Form (Annexure- I) duly signed to e-Tendering agency before due date. After the completion of the tender event, all the Bidders have to submit the Price Breakup immediately to e-Tendering agency for further proceedings.

E Tendering Agency Contact Details:

1. Kushal Bose

Antares Systems Ltd. Mob.+91 7686913157

Email: kushal.b@antaressystems.com.

2. Biswajeet : 9674758723

Email: "biswajit.c@antaressystems.com

3. Alternate E mail ids

Helpdesk Tenderwizard" helpline1tenderwizard@gmail.com

PROCESS COMPLIANCE STATEMENT**(Annexure- I)**

(The bidders are required to print this on their company's letterhead and sign, stamp it before emailing/submission online.)

M/s Antares Systems Ltd
Mob.+91 7686913157
Email: kushal.b@antaressystems.com
helpline1tenderwizard@gmail.com

Agreement to the Process Related Terms and Conditions for the on-line e – tendering for Addition, Alteration & Construction of G+1 Storied Building for RSETI Rayagada, Odisha

Dear Sir,

This has reference to the Terms & Conditions for the E-tendering mentioned in the Tender Document. This letter is to confirm that:

- 1) The undersigned is authorized representative of the company.
- 2) We have studied the Commercial Terms and the Business rules governing the E-tendering as mentioned in Tender of SBI as well as this document and confirm our agreement to them.
- 3) We also confirm that we have taken the training on the E-tendering tool and have understood the functionality of the same thoroughly.
- 4) We confirm that SBI and M/s. **Antares Systems Ltd** shall not be liable & responsible in any manner whatsoever for my/our failure to access & bid on the e-E-tendering platform due to loss of internet connectivity, electricity failure, virus attack, problems with the PC, any other unforeseen circumstances etc. before or during the E-tendering event.
- 5) We confirm that we have a valid digital signature certificate issued by a valid Certifying Authority.
- 6) We, hereby confirm that we will honour the Bids placed by us during the E-tendering process.

With regards,

Date:

Name:

Company / Organization:

Designation within Company / Organization: Address of Company / Organization:

Scan it and send to this Document on -----

FORM OF TENDER

Annexure-II

To,
AGM (LB & RSETI),
State Bank of India,
Local Head Office,
Bhubaneswar.

Dear Sir,

ADDITION, ALTERATION & CONSTRUCTION OF G+1 STORIED BUILDING FOR RSETI RAYAGADA, ODISHA

I/We refer to the tender notice issued by you for **addition, alteration & construction of G+1 storied building for RSETI Rayagada, Odisha**, in connection with above subject.

1. I/we have satisfied myself/ourselves as to the site conditions examined the drawings and all aspects of the tender conditions subject to above, I/We do hereby agree should this tender be accepted in whole or part of:
 - a. Abide by and fulfil all the terms and provisions of the said conditions annexed hereto:
 - b. Complete the work within the timeline as stipulated in two or three shifts if considered necessary by the consultants/ architects at no extra cost to the bank,
2. I/we have deposited the earnest money of **Rs.1,86,000.00** which we note will not bear any interest and is liable to forfeiture,
 - i. If the offer is withdrawn within the validity period of acceptance or
 - ii. If the contract is not executed within 15 days from award of contract, or
 - iii. The acceptance of this tender shall constitute a breach of contract by us & the tender accepting authority shall be entitled to have the work executed at our risk and cost and to claim extra cost/expenditure incurred by then from us
3. Unless and until a formal agreement is prepared and executed, this tender together with your written acceptance thereof shall constitute as a binding contract,
4. I/We understand that you are not bound to accept the lowest any tender received,
5. I/we have independently considered the amount of liquidated damages in the Appendix the General Conditions of contract and agree that it represents fair estimate of the loss likely to etc. to be suffered by you in the event of the works not being completed in time,
6. Our _____ bankers are: _____

The name of partners/ directors of the firm authorized to sign or name of persons having power of attorney to sign the contract (certified true copy of the power of attorney should be attached).

Yours faithfully

Signature of contractor/ authorized representative

Signature and address of witness (Mobile No and e mail address if any)

1.

2.

Notes to schedule items

1. Tenderers shall include their rates quoted for preliminary and general items required for the execution of work such as tools, plants, workman's shed, temporary offices, cleaning site, scaffolding up to the required height etc. The description of each item shall unless otherwise stated be held to include conveyance, labour, finishing to required shape and size, setting, fitting and fixing in position, straight cutting and wastes, return of packings, overheads, profits and other unless otherwise stated, be held to include the consequent waste.
2. The rates quoted by the contractor should cover for work at any height for all items of work under this contract. List of all materials will not form a criterion for any extra payment unless other contractors used in the particular item.
In the event of arithmetical error/errors being discovered in the contract document, the rates mentioned in the words in tender copy marked original will only be taken as Bonafide.
3. Contractor should note that the tender **is item wise based rate** and their attention is drawn to the fact that their rates for each and every item should be correct, workable and self-supporting. If called upon by architect/ Employer details analysis of any or all rates shall be bound to recognise contractors' analysis.
4. Contractor should note that their rates should be inclusive of all attendance on their sub-contractors and also for making good any holes and chases left by the sub-contractor before the building work is completed.
5. The Contractor shall be responsible for procuring all required materials sufficiently in advance and see that the work is never hindered for meant of materials or due to any other reason or restriction.
6. The contractor shall have to carry out all connected work within the boundary of proposed work and inside the building if ordered to do so by the architect/ employer at the rate quoted in the schedule items.
7. The contractor is to study architectural drawings before commencing work. In case of discrepancy, the contractor must report to the architect/ employer immediately and shall get the same rectified before proceeding it.
8. The rate quoted for Electrical installation works shall include all necessary charges/requirements complying with Indian electricity act and rules in force for the work.
9. All works which shall be used in the work must be form the list of the approved materials as mentioned in the specification. Samples of materials proposed to be used shall be submitted to the Consultant/Bank for Approval.
10. General spirit of the technical specification and method of measurement shall be as laid down in the latest edition of I S code of practice. Rates quoted for all items shall include for the cost of supplying labour and materials fixing and erection complete with all the application necessary for proper execution and carrying out of the work to

the truest sense of drawing and specification through this may not be mentioned in particular item of the schedule items.

11. The quoted rates shall include clearing site from all shrubs, vegetation, bushes, tress, before commencement of work even if not otherwise specified. Trees with girth of above 4500mm and measured 300mm above GL shall be cut with prior permission form Bank / consultant adhere to statutory norm/NOC from local Authority/Forest department, as applicable.
12. The quoted rate shall be deemed inclusive of costs, of all labour, materials, tools, plants Equipment, curing cost al lead and lift and all taxes, duties octroi even if these are not otherwise mentioned in items. GST shall be paid extra as applicable.
13. Products with ISI sample, if available shall be use with prior approval of the consultant/ employer reserves the right to select any particular brand between different state products of the same category.

ARTICLES OF AGREEMENT (DRAFT)

This agreement made theday of between Assistant General Manager (LB & RSETI), State Bank of India, Local Head Office, Bhubaneswar (hereinafter called the Bank or SBI) which expression shall include the successors and assigns) of the one part and M/s. company / partnership for registered under the Indian Companies Act/ Partnership Act having its registered office..... (hereinafter called 'the Contractors' which expression shall include the present directors / partners and also the directors / partners from time to time as also their respective heirs, legal representatives, administrators and assigns) of the other part.

WHEREAS the employer is desirous of execution of addition, alteration & construction of G+1 storied building for RSETI Rayagada, Odisha. (Name of work) and has caused drawings and specifications describing the works to be done prepared by Project Architects M/s Designers Forum having their offices at IRC Village, Bhubaneswar (hereinafter called "the Architect")

AND WHEREAS THE SAID Drawings numbered as mentioned in the tender documents hereinafter mentioned and to be issued from time to time, the specifications and the Schedule of items and quantities have been signed by or on behalf of the parties hereto.

AND whereas the contractors have agreed to execute upon and subject to the condition set forth herein and Schedule of items and quantities, General & special Conditions of Contract, specification etc. contained in the tendered documents including all correspondences exchanged by or between the parties from the submission of tender till the award of work, both letters inclusive, (all of which are collectively hereinafter referred to as "the said conditions"). The works shown upon the said drawing and /or described in the said specification and included in the schedule of Items and Quantities at the respective rates therein set forth amounting to the sum of Rs. _____ (Rupees _____ in words _____) as there in arrived at or such other sum as shall become payable there under (hereinafter referred to as "the said Contract Amount").

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the said Contract amount to be paid at the times and the manner set forth in the said Conditions, the Contractors shall upon and subject to the said conditions execute and complete the work shown upon the said drawings and described in the said specifications and the schedule of items and quantities.
2. The employer shall pay the Contractors the amount or such other sum as shall become payable, at the times and in the manner specified in the said conditions.
3. The term "the Architect" in the said condition shall mean the said "**M/s Designers Forum**" or in the event of their ceasing to be the Architect for the purpose of this contract for whatever reason, such other person or persons as shall be nominated for that purpose by the Employer, not being a person to whom the Contractor shall object for reasons considered to be sufficient by the Employer provided always that no person or persons subsequently appointed to be Architect under this contract shall be entitled to disregard or over rule any previous decisions or approval or direction given or expressed in writing by the architect for the time being.
4. The said conditions and appendix thereto shall be read and construed as forming part of this agreement, and the parties hereto shall respectively abide by / submit themselves to the said conditions and perform the agreements on their part respectively in the said conditions contained.

- 5. The plans, agreement and documents mentioned herein shall form the basis of this contract.
- 6. This contract is neither a fixed Lump sum contract nor a piece work contract but is a contract to carry out the work in respect of the entire project on percentage rate basis to be paid for according to actual measured quantities at the rates contained in the schedule of quantities and rates or as provided in the said conditions.
- 7. The Bank / Employer reserves to itself the rights of altering the specifications and nature of work by adding to or omitting any item of work or having portions of the same carried out without prejudice to the contract.
- 8. Time shall be considered as the essence of this contract and the contractor here by agrees to commence the work soon after the site is handed over to him or from the 14th day after date of issue of formal work order as provided for in the said conditions of contractor whichever is later and to complete the entire work within ____ (period of contract) months subject never the less to the provisions for extension of time.
- 9. All payments by the Employer under this contract will be made only at Bhubaneswar.
- 10. Any dispute arising under this Agreement shall be referred to arbitration in accordance with the stipulations laid down in the tender.
- 11. That all the parts of this contract have been read by the contractor and fully understood by the contractor. They further agree to complete the said work to fullest satisfaction of architect / Employer.
- 12. IN WITNESS WHEREOF the Employer and the contractors have set their respective hands to these present through their duly authorized official and the said two duplicates hereof to be executed on its behalf of the day and year first herein above written.

Signed on behalf of the

Signed on behalf of the

STATE BANK OF INDIA

CONTRACTORS

In the presence of:

In the presence of:

1. Signature :

1. Signature :

Name :

Name :

Address :

Address :

In the presence of:

In the presence of:

2. Signature :

2. Signature :

Name :

Name :

Address :

Address :

GENERAL CONDITIONS OF THE CONTRACT

1.0 Definitions

“Contract” means the documents forming the tender and the acceptance thereof and the formal agreement executed between SBI and the contractor, together with the documents referred therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Architects/SBII and all these, documents taken together shall be deemed to form one contract and shall be, complementary to one another.

1.1 In the contract the following expressions shall, unless the context otherwise requires, have the meaning hereby respectively assigned to them.

1.1.1 **‘SBI / Bank’** shall mean State Bank of India (client) a body Corporate created under SBI Act 1955, having one of its Circle Office at State Bank of India, III/1 Pandit Jawaharlal Nehru Marg, Bhubaneswar- 01 and includes the client’s representatives, successors and assigns.

1.1.2 **‘Architects/Consultants’** shall mean **M/s. Designers Forum, Bhubaneswar**

1.1.3 **‘Site Engineer’** shall mean an Engineer appointed by the Bank/Architect as their representative to give instructions to the contractors.

1.1.4 **‘The Contractor’** shall mean the individual or firm or company whether incorporated or not, undertaking the works and shall include legal personal representative of such individual or the composing the firm or company and the permitted assignees of such individual or firms of company.

1.1.5 The expression **‘works** or ‘work’ shall mean the permanent or temporary work described in the ‘Scope of Work’ and/or to be executed in accordance with the contract and includes materials, apparatus, equipment, temporary supports, fittings and things of all kinds to be provided, the obligations of the contractor hereunder and work to be done by the contractor under the contract.

1.1.6 **‘Engineer’** shall mean the representative of the Architect/consultant.

1.1.7 **‘Drawings’** shall mean the drawings prepared and issued by the Architects duly approved by the Bank and referred to in the specifications and any modifications of such drawings as may be issued from time to time ‘Contract value shall mean the value of the entire work as stipulated in the letter of acceptance of tender subject to such additions thereto or deductions there from as may be made under the provision hereinafter contained.

1.1.8 **‘Specifications’** shall mean the specifications referred to in the tender and any modifications thereof as maybe time to time be furnished or approved by the architect/ consultant
“Month” means calendar month.

1.1.9 **“Week”** means seven consecutive days.

1.1.10 **“Day”** means a calendar day beginning and ending at 00 Hrs and 24 hrs respectively.

1.1.11 **“SOQ/BOQ”** may read as Schedule or Bill of Quantities.

1.1.12 The project/work as stated in the tender “Addition, Alteration & Construction of G+1 Storied Building for RSETI Rayagada, Odisha: Civil, PH & allied Electrical work”.

CLAUSES:

1.0 Total Security Deposit: Total Security deposit comprises of:

- Earnest Money Deposit
- Initial Security Deposit
- Retention Money

c) Retention Money: Total security deposit shall be 5% of the final value of the work. Out of this 2% of tender value (i.e. tender amount) is in the form of initial security deposit (ISD) which includes the EMD. Balance security deposit (i.e. 5% of final value of work less 2% of tender value already deposited as ISD) towards the work shall be deducted from the running account bill of the work as Retention money at the rate of 10% of the respective running account bill i.e. deduction from each running bill account will be 10% till total 5% of final value of work as per final bill is reached. 50% of the total security i.e. 2.5% of the final value of work shall be paid to the contractors on the basis of Project Engineer-in-Charge certifying the virtual completion and its approval by SBI. The balance 50% i.e. 2.5% of final value of work would be paid to the contractors after the defects liability period as specified in the contract and after satisfactory completion of CVC Audit. In case CVC Audit is not conducted, 1.25% of final value of work will be retained for a maximum period of further one year (w.e.f. completion of defect liability period).

2.0 Language Errors, Omissions and Discrepancies: In case of errors, omissions and/or disagreement between written and scaled dimensions on the drawings or between the drawings and specifications etc, the following order shall apply.

- i) Between scaled and written dimension (or description) on a drawing, the latter shall be adopted.
- ii) Between the written or shown description or dimensions in the drawings and the corresponding one in the specification the former shall be taken as correct.
- iii) Between written descriptions of the item in the specifications and descriptions in bills of quantities of the same item, the latter shall be adopted.
- iv) In case of a difference between rates written in figures and words, the rate in words shall prevail.
- v) Between the duplicate/subsequent copies of the tender, the original tender shall be taken as correct.

3.0 Scope of Work: The contractor shall carry out, complete, and maintain the said work in every respect strictly in accordance with this contract and with the directions of and to the satisfaction of the SBI /architect/consultant. The architect/consultant at the directions of the Bank from time to time issue further drawings and/or written instructions, details directions

and explanations which are hereafter collectively referred to as SBI/Architect's instructions in regard to : the variation or modification of the design, quality or quantity of work or the addition or omission or substitution of any work, any discrepancy in the drawings or between the BOQ and/or drawings and/or specifications, the removal from the site of any material brought thereon by the contractor and the substitution of any other materials thereof, the demolition, removal and/or re-execution of any work executed by him, the dismissal from the work of any person employed/engaged thereupon.

4.0 (i) Letter of Acceptance: Within the validity period of the tender the SBI shall issue a letter of acceptance either directly or through the architect by registered post/e-mail/speed post or otherwise depositing at the address of the contractor as given in the tender to enter into a Contract for the execution of the work as per the terms of the tender. The letter of acceptance shall constitute a binding contract between the SBI and the contractor.

ii) Contract Agreement: On receipt of intimation of the acceptance of tender from the SBI/Architect the successful tenderer shall be bound to implement the contract and within fifteen days thereof, he shall sign an agreement in a non-judicial stamp paper of appropriate value (as per the Article of Agreement format earlier given in this document) with SBI.

5.0 Ownership of drawings: All drawings, specifications and copies thereof furnished by the SBI, through its architect/ consultants are the properties of the SBI. They are not to be used on other work.

6.0 Detailed drawings and instructions: The SBI through its architects/consultants shall furnish with reasonable promptness additional instructions by means of drawings or otherwise necessary for the proper execution of the work. All such drawings and instructions shall be consistent with the contract documents, true developments thereof and reasonably inferable there from.

The work shall be executed in conformity therewith and the contractor shall prepare a detailed programme schedule (i.e. BAR/PERT Chart) indicating therein the date of start and completion of various activities on receipt of the work order and submit the same to the SBI through the Architect/Consultant.

7.0 Copies of Agreement: Out of Six copies, two copies of agreement/tender document duly signed by both the parties with the drawings shall be handed over to the contractors, two copies to SBI and one copy each shall be for the use of SBI and Architect.

8.0 Liquidated Damages: If the contractor fails to maintain the required progress in terms of contract or to complete the work and clear the site including vacating their office on or before the contracted or extended date or completion without justification in support of the cause of delay, he may be called upon without prejudice to any other right of remedy available under the law to the SBI on account of such breach to pay a liquidated damages at the rate of 0.5% of the final value of work per week subject to a maximum of 5% of the final value of work.

9.0 Materials, Appliances, and Employees: Unless or otherwise specified the contractor shall provide and pay for all materials, labour, water, power, tools, equipment transportation and any other facilities that are required for the satisfactory execution and completion of the

work. Unless or otherwise specified all materials shall be new and both workmanship and materials shall be best quality. The contractor shall at all times enforce strict discipline and good order among his employees/workers and shall not employ on the work any unfit person/worker or anyone not skilled in the work assigned to him. Workman whose work or behaviour is found to be unsatisfactory by the SBI /Architect, he shall be removed from the site immediately.

10.0 Permits, Laws and Regulations: Permits and licences required for the execution of the work shall be obtained by the contractor at his own expenses. The contractor shall give notices and comply with the regulations, laws/ labour laws, and ordinances rules, applicable to the contractor. If the contractor observes any discrepancy between the drawings and specifications, he shall promptly notify the SBI in writing under intimation of the Architect/Consultant. If the contractor performs any act which is against the law, rules and regulations he shall meet all the costs arising there from and shall indemnify the SBI any legal actions arising there from.

11.0 Setting out Work: The contractor shall set out the work 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 and get it approved by the architect/consultant before proceeding with the work. If at any time any error in this respect shall appear during the progress of the works, irrespective of the fact that the layout had been approved by the architect/consultant the contractor shall be responsible for the same and shall at his own expenses rectify such error, if so, required to satisfaction of the SBI.

12.0 Protection of works and property: The contractor shall continuously maintain adequate protection, of all his work from damage and shall protect the SBI's properties from injury or loss arising in connection with contract. He shall make good any such damage, injury, loss due to his fault or negligence except which are due to causes beyond his control.

He shall take adequate care and steps for protection of the adjacent properties. The contractor shall take all precautions for safety and protection of his employees on the works and shall comply with all applicable provisions of Government and local bodies' safety laws and relevant building codes to prevent accidents, or injuries to persons or property of about or adjacent to his place of work. The contractor shall take insurance covers as per clause 25.0 at his own cost. The policy may be taken in joint names of the contractors and the SBI and the original policy may be lodged with the SBI.

13.0 Inspection of Work: SBI/Architect/Consultant or their representatives shall at all reasonable time have free access to the work site and/or to the workshop, factories or other places where materials are lying or from where they are obtained and the contractor shall give every facility to the /SBI/Architect/Consultant and their representatives necessary for inspection and examination and test of the materials and workmanship. No person unless authorized by the SBI/Architect/Consultant except the representative of Public authorities shall be allowed on the work at any time. The proposed work either during its construction stage or its completion can also be inspected by the Chief Technical Examiner's organization a wing of Central Vigilance Commission.

14.0 Assignment and subletting: The whole of work included in the contract shall be executed by the contractor and he shall not directly entrust and engage or indirectly transfer as-

sign or underlet the contract or any part or share thereof or interest therein without the written consent of the SBI /SBI through the architect and no undertaking shall relieve the contractor from the responsibility of the contractor from active superintendence of the work during its progress.

15.0 Quality of Materials, Workmanship & Test: All materials and workmanship shall be best of the respective kinds described in the contract and in accordance with SBI/Architect's instructions and shall be subject from time to time to such tests as the SBI/Architect may direct at the place of manufacture or fabrication or on the site or an approved testing laboratory.

The quantity given in SOQ are intended to cover the entire new structure indicated in the drawing but the employer reserves the right to execute only a part or the whole or any excess thereof without assigning any reason thereof. Qty not mentioned in the item will also be executed that are necessary to complete the work. The rate shall be derived as per prevailing market ate including CPOH 15%. The contractor shall provide such assistance, instruments, machinery, labour and materials.

Contractor to made arrangement of laboratory on site, where weight of various materials like aluminium extrusions etc. can be done, Contractor should also make available 3.00 meters, 15.00 meters & a 50.00 meters tape, a Vernier Calliper & Micrometre so any measurements/ tests can be taken on sites itself.

(ii) Samples: All samples of adequate numbers, size, shades & pattern as per specifications shall be supplied by the contractor without any extra charges. If certain items proposed to be used are of such nature that samples cannot be presented or prepared at the site detailed literature/test certificate of the same shall be provided to the satisfaction of the SBI/Architect. Before submitting the sample/literature the contractor shall satisfy himself that the material/equipment for which he is submitting the samples/literature meet with the requirement of tender specification. Only when the samples are approved in writing by the SBI /Architect the contractor shall proceed with the procurement and installation of the particular material/equipment.

The approved samples shall be signed by the SBI /Architect for identification and shall be kept on record at site office until the completion of the work for inspection/comparison at any time. The SBI/Architect shall take reasonable time to approve the sample. Any delay that might occur in approving the samples for reasons of its not meeting the specifications or other discrepancies inadequacy in furnishing samples of best qualities from various manufacturers and such other aspects causing delay on the approval of the materials/equipment etc. shall be to the account of the contractor.

(iii) Cost of tests: The cost of making any test shall be borne by the contractor if such test is intended by or provided for in the specifications or BOQ.

(iv) Cost of test not provided for: If any test is ordered by the SBI/Architect which is either:

- (a) If so intended by or provided for or (in the cases above mentioned) is not so particularized or through so intended or provided for but ordered by the SBI/ Architect which is either to be carried out by an independent person at any place other than the site

or the place of manufacture or fabrication of the materials tested or any Government/approved laboratory, then the cost of such test shall be borne by the contractor.

16.0 Obtaining Information related to execution of work: No claim by the contractor for additional payment shall be entertained which is consequent upon failure on his part to obtain correct information as to any matter affecting the execution of the work nor any misunderstanding or the obtaining incorrect information or the failure to obtain correct information relieve him from any risks or from the entire responsibility for the fulfilment of contract.

17.0 Contractor's superintendence: The contractor shall give necessary personal superintendence during the execution of the works and as long, thereafter, as the SBI/Architect may consider necessary until the expiry of the defect liability period, stated hereto.

18.0 Quantities: i) The bill of quantities (BOQ) unless or otherwise stated shall be deemed to have been prepared in accordance with the Indian Standard Method of Measurements

The rate quoted shall remain valid for variation of quantity against individual item to any extent subject to maximum variation of the contract value by 25%. The entire amount paid under Clause 20 hereof as well as amounts of prime cost and provisional sums, if any, shall be excluded.

ii) Variation exceeding 25%: The items of work executed in relation to variation exceeding 25% shall be paid on the basis of provisions of clause 21(e) hereof. Rate of this item will not exceed the tender rate.

19.0 Works to be measured: The SBI/Architect may from time to time intimate to the contractor that he required the work to be measured and the contractor shall forthwith attend or send a qualified representative to assist the SBI/Architect in taking such measurements and calculation and to furnish all particulars or to give all assistance required by any of them. Such measurements shall be taken in accordance with the Mode of measurements detailed in the specifications. The representative of the SBI/ Architect shall take joint measurements with the contractor's representative and the measurements shall be entered in the measurement book.

The contractor or his authorized representative shall sign all the pages of the measurement book in which the measurements have been recorded in token of his acceptance. All the corrections shall be duly attested by both representatives. No writings shall be made in the measurement book. Should the contractor not attend or neglect or omit to depute his representative to take measurements then the measurements recorded by the representative of the SBI/ Architect shall be final. All authorized extra work, omissions and all variations made shall be included in such measurements.

20.0 Variations: No alteration, omission or variation ordered in writing by the SBI/Architect shall vitiate the contract.

In case the SBI /SBI/Architect thinks proper at any time during the progress of works to make any alteration in, or additions to or omission from the works or any alteration in the kind or quality of the materials to be used therein, the Architect/Consultant shall give notice thereof in writing to the contractor or shall confirm in writing within seven days of giving such

oral instructions the contractor shall alter to, add to, or omit from as the case may be in accordance with such notice but the contractor shall not do any work extra to or make any alteration or additions to or omissions from the works or any deviation from any of the provisions of the contract, stipulations, specifications or contract drawings without previous consent in writing of the Architect/Consultant and the value of such extras, alterations, additions or omissions shall in all cases be determined by the Architect/Consultant and the same shall be added to or deducted from the contract value, as the case may be.

21.0 Valuation of Variations: No claim for an extra shall be allowed unless it shall have been executed under the authority of the Architect with the concurrence of the SBI as herein mentioned. Any such extra is herein referred to as authorized extra and shall be made in accordance with the following provisions.

a. The net rates or prices in the contract shall determine the valuation of the extra work where such extra work is of similar character and executed under similar conditions as the work priced herein. Rates for all items, wherever possible should be derived out of the rates given in the priced BOQ.

b. The net prices of the original tender shall determine the value of the items omitted, provided if omissions do not vary the conditions under which any remaining items of works are carried out, otherwise the prices for the same shall be valued under sub clause (c) hereunder.

c. Where the extra works are not of similar character and/or executed under similar conditions as aforesaid or where the omissions vary the conditions under which any remaining items or works are carried out, then the contractor shall within 7 days of the receipt of the letter of acceptance inform the SBI/Architect of the rate which he intends to charge for such items of work, duly supported by analysis of the rate or rates claimed and the SBI/Architect shall fix such rate or prices as in the circumstances in his opinion are reasonable and proper, based on the market rate.

d. Where extra work cannot be properly measured or valued the contractor shall be allowed day work prices at the net rates stated in the tender of the BOQ or, if not, so stated then in accordance with the local day work rates and wages for the district; provided that in either case, vouchers specifying the daily time (and if required by the SBI /SBI/Architect) the workman's name and materials employed be delivered for verifications to the Architect/Consultant at or before the end of the week following that in which the work has been executed.

e. It is further clarified that for all such authorized extra items where rates cannot be derived from the tender, the contractor shall submit rates duly supported by rate analysis worked on the "market rate basis" for material, labour, hire/running charges of equipment and wastages etc. plus 15% towards establishment charges, contractor's overheads and profit. Such items shall not be eligible for escalation.

22.0 Final Measurement: The measurement and valuation in respect of the contract shall be completed within **one month** of the virtual completion of the work.

23.0 Virtual Completion Certificate (VCC): On successful completion of entire works covered by the contract to the full satisfaction of the SBI, the contractor shall ensure that the following works have been completed to the satisfaction of the SBI-

- a) Clear the site of all scaffolding, wiring, pipes, surplus materials, contractor's labour, equipment and machinery.
- b) Demolish, dismantle and remove the contractor's site office, temporary works, structures including labour sheds/camps and constructions and other items and things whatsoever brought upon or erected at the site or any land allotted to the contractor by the SBI and not incorporated in the permanent works.
- c) Remove all rubbish, debris etc from the site and the land allotted to the contractor by the SBI and shall clear, level and dress, compact the site as required by the SBI.
- d) Shall put the SBI in undisputed custody and possession of the site and all land allotted by the SBI.
- e) Shall hand over the work in a peaceful manner to the SBI.
- f) All defects/imperfections have been attended and rectified as pointed out by the SBI to the full satisfaction of SBI.

Upon the satisfactory fulfilment by the contractor as stated above, the contractor shall be entitled to apply to the Architect/Consultant for the certificate. If the SBI/Architect/Consultant is satisfied of the completion of the work, relative to which the completion certificate has been sought, the SBI/Architect/Consultant shall within fourteen (14) days of the receipt of the application for virtual completion certificate, issue a VCC in respect of the work for which the VCC has been applied.

This issuance of a VCC shall be without prejudice to the /SBI's rights and contractor's liabilities under the contract including the contractor's liability for defects liability period nor shall the issuance of VCC in respect of the works or work at any site be construed as a waiver of any right or claim of the SBI against the contractor in respect of works or work at the site and in respect of which the VCC has been issued.

23A. Defects after Completion:

The contractor shall make good at his own cost and to the satisfaction of the employer all defects, shrinkages, settlement or other faults which may appear **within 12 months** after virtual completion of work. In default, the employer may employ and pay other persons to amend and make such damages, loses and expenses consequent thereon or incidental thereto shall be made good and borne by the contractor and such damages, loss and expenses shall be recoverable from him by the employer or may be deducted by the employer in lieu of such amending and making good by the contractor deduct from any money due to the contractor a sum of equivalent to the cost of amending such work and in the event of the amount retained being insufficient, recover that balance from the contractor from the amount retained under relevant clause together with any expenses the employer may have incurred in connection therewith

24.0 Work by other agencies: The SBI/Architect reserves the rights to use premises and any portion of the site for execution of any work not included in the scope of this contract which it may desire to have carried out by other persons simultaneously and the contractor shall not only allow but also extend reasonable facilities for the execution of such work. The contractor however shall not be required to provide any plant or material for the execution of such work except by special arrangement with the SBI. Such work shall be carried out in such manners not to impede the progress of the works included in the contract.

For Electrical work, the contractor who engages SBI empanelled electrical contractor of min. work value 25 Lakhs or above in HT/LT category under Bhubaneswar Circle need to obtain prior permission from the Bank and sign a MOU between them.

25.0 Insurance of Works

25.1 Without limiting his obligations and responsibilities under the contract the contractor shall ensure in the joint names of the SBI and the contractor against all loss or damages from whatever cause arising other than the excepted risks, for which he is responsible under the terms of the contract and in such a manner that the SBI and contractor are covered for the period stipulated in clause 28 of GCC and are also covered during the period of maintenance for loss or damage arising from a cause, occurring prior to the commencement of the period of maintenance and for any loss or damage occasioned by the contractor in the course of any operations carried out by him for the purpose of complying with his obligations under the clause.

- a) The works for the time being executed to the estimated current Contract value thereof, or such additional sum as may be specified together with the materials for incorporation in the works at their replacement value.
- b) The constructional plant and other things brought on to the site by the contractor to the replacement value of such constructional plant and other things.
- c) Such insurance shall be effected with an insurer and in terms approved by the SBI which approval shall not be unreasonably withheld and the contractor shall whenever required produce to the SBI/Architect the policy of insurance and the receipts for payment of the current premiums.

25.2 Damage to persons and property: The contractor shall, except if and so far as the contract provides otherwise indemnify the SBI against all losses and claims in respect of injuries or damages to any person or material or physical damage to any property whatsoever which may arise out of or in consequence of the execution and maintenance of the works and against all claims proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto except any compensation of damages for or with respect to :

- a) The permanent use or occupation of land by or any part thereof.
- b) The right of SBI to execute the works or any part thereof, on, over, under, in, or through any lands.
- c) Injuries or damages to persons or properties which are an unavoidable result of the execution or maintenance of the works in accordance with the contract.

d) Injuries or damage to persons or property resulting from any act or neglect of the SBI, their agents, employees or other contractors not being employed by the contractor or in respect of any claims, proceedings, damages, costs, charges and expenses in respect thereof or in relation thereto or where the injury or damage was contributed to by the contractor, his servants or agents such part of the compensation as may be just and equitable having regard to the extent of the responsibility of the SBI, their employees, or agents or other employees, or agents or other contractors for the damage or injury.

25.3 Contractor to indemnify SBI: The contractor shall indemnify the SBI against all claims, proceedings, damages, costs, charges and expenses in respect of the matters referred to in the provision sub-clause 25.2 of this clause.

25.4 Contractor's superintendence: The contractor shall fully indemnify and keep indemnified the SBI/SBI against any action, claim, or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claim made under or action brought against SBI in respect of such matters as aforesaid, the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expenses to settle any dispute or to conduct any litigation that may arise therefrom, provided that the contractor shall not be liable to indemnify the SBI if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the SBI/Architect in this behalf.

The contractor shall employ at least the following technical staff besides other personal: One graduate engineer / Sr Diploma holder having experience of 5yrs or more. The above technical staff should be available at site to take instructions whenever required by the architect/employer. In case the contractor fails to comply the technical staff as aforesaid he shall be liable to pay a sum of RS. 5000 each month or part thereof for default. The decision of architect/employer so as to the period will be final and binding on the contract.

25.5 Third-Party Insurance

25.5.1 Before commencing the execution of the work the contractor but without limiting his obligations and responsibilities under clause 25 of GCC shall insure against his liability for any material or physical damage, loss, or injury which may occur to any property including that of SBI, or to any person, including any employee of the SBI, by or arising out of the execution of the works or in the carrying out of the contract, otherwise than due to the matters referred to in the provision to clause 25 thereof.

25.5.2 Minimum Amount of Third-Party Insurance: Such insurance shall be affected with an insurer and in terms approved by the SBI which approval shall not be reasonably withheld and for at least the amount stated below. The contractor shall, whenever required, produce to the SBI/Architect the policy or policies of insurance cover and receipts for payment of the current premiums.

The minimum insurance cover for physical property, injury, and death is Rs.5.0 lacs per occurrence with the number of occurrences limited to four. After each occurrence contractor will pay the additional premium necessary to make insurance valid for four occurrences always.

25.7 Accident or Injury to Workmen

25.7.1 The SBI shall not be liable for or in respect of any damages or compensation payable at law in respect or in consequence of any accident or injury to any workmen or other person in the employment of the contractor or any sub-contractor, save and except an accident or injury resulting from any act or default of the SBI or their agents, or employees. The contractor shall indemnify and keep indemnified SBI against all such damages and compensation, save and except as aforesaid and against all claims, proceedings, costs, charges, and expenses whatsoever in respect thereof or in relation thereto.

25.7.2 Insurance against accidents etc to workmen: The contractor shall insure against such liability with an insurer approved by the SBI during the whole of the time any person employed by him on the works and shall, when required, produce to the architect/consultant such policy of insurance and receipt for payment of the current premium. Provided always that, in respect of any persons employed by any sub-contractor the contractor's obligation to insure as aforesaid under this sub-clause shall be satisfied if the sub-contractor shall have insured against the liability in respect of such persons in such manner that SBI is indemnified under the policy but the contractor shall require such sub-contractor to produce to the SBI/Architect when required such policy of insurance and the receipt for the payment of the current premium.

25.7.3 Remedy on Contractor's failure to insure: If the contractor fails to effect and keep in force the insurance referred to above or any other insurance which he may be required to effect under the terms of contract, then and in any such case the SBI may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the SBI as aforesaid and also deduct 15% of contract value from any amount due or which may become due to the contractor, or recover the same as debt from the contractor.

Without prejudice to the other rights of the SBI against contractors, in respect of such default, the SBI shall be entitled to deduct from any sums payable to the contractor the amount of any damage costs, charges, and other expenses paid by the SBI and which are payable by the contractors under this clause. The contractor shall upon settlement by the insurer of any claim made against the insurer pursuant to a policy taken under this clause, proceed with due diligence to rebuild or repair the works destroyed or damaged. In this event all the monies received from the insurer in respect of such damage shall be paid to the contractor and the contractor shall not be entitled to any further payment in respect of the expenditure incurred for rebuilding or repairing of the materials or goods destroyed or damaged.

26.0 Commencement of Works: The date of commencement of the work will be reckoned as the recorded date of handing over site by the SBI/SBI or **14 days** from the date of receipt of Letter of Acceptance from SBI, whichever is later.

27.0 Time for completion: Time is the essence of the contract and shall be strictly observed by the contractor. The entire work shall be completed within a period of **Twelve Calendar month from the date of commencement**. If required in the contract or as directed by the SBI/Architect, the contractor shall complete certain portions of work before completion of the entire work. However, the completion date shall be reckoned as the date by which the whole work is completed as per the terms of the contract.

28.0 Extension of Time: If, in the opinion of the Architect/Consultant, the work be delayed for reasons beyond the control of the contractor, the Architect/Consultant may submit a recommendation to the SBI to grant a fair and reasonable extension of time for completion of work as per the terms of contract. If the contractor needs an extension of time for the completion of work or if the completion of work is likely to be delayed for any reasons beyond the due date of completion as stipulated in the contract, the contractor shall apply to the SBI through the Architect/Consultant in writing at least 15 days before the expiry of the scheduled time and while applying for extension of time he shall furnish the reasons in detail and his justification if any, for the delays. The architect/consultant shall submit their recommendations to the SBI in the prescribed format for granting extension of time. While granting extension of time the contractor shall be informed the period extended time which will qualify for levy of liquidated damages. For the balance period in excess of original stipulated period and duly sanctioned extension of time by the SBI the provision of liquidated damages as stated under clause 8 of GCC shall become applicable. Further contract shall remain in force even for the period beyond the due date of completion irrespective whether the extension is granted or not.

29.0 Rate of progress: Whole of the materials, plant and labour to be provided by the contractor and the mode, manner and speed of execution and maintenance of the works are to be of a kind and conducted in a manner to the satisfaction of the SBI/Architect. Should the rate of progress of the work or any part thereof be at any time be in the opinion of the SBI /Architect too slow to ensure the completion of the whole of the work by the prescribed time or extended time for completion the SBI /Architect shall thereupon take such steps as considered necessary to expedite progress so as to complete the woks by the prescribed time or extended time. Such communications from the SBI /Architect neither shall relieve the contractor from fulfilling obligations under the contract nor he shall be entitled to raise any claims arising out of such directions.

30.0 Work during nights and holidays: Subject to any provision to the contrary contained in the contract no permanent work shall save as herein provided be carried on during the night or on holidays without the permission in writing of the SBI/Architect, save when the work is unavoidable or absolutely necessary for the saving of life or property or for the safety of the work in which case the contractor shall immediately advise the SBI/Architect. However, the provision of the clause shall not be applicable in the case of any work which becomes essential to carry by rotary or double shifts in order to achieve the progress and quality of the part of the works being technically required and continued with the prior approval of the SBI/Architect at no extra cost to the SBI.

All work at night after obtaining approval from competent authorities shall be carried out without unreasonable noise and disturbance so as to avoid disputes with the neighbours.

31.0 No compensation for restrictions of work: If at any time after acceptance of the tender SBI shall decide to abandon or reduce the scope of work for any reason whatsoever and hence not require the whole or any part of the work to be carried out, the SBI Architect shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the work fully but which he did not derive in consequence of the fore-

closure of the whole or part of the work. Provided that the contractor shall be paid the charges on the cartage only of materials actually and bona fide brought to the site of the work by the contractor and rendered surplus as a result of the abandonment, curtailment of the work or any portion thereof and then taken back by the contractor, provided however that the SBI /Architect shall have in such cases the option of taking over all or any such materials at their purchase price or a local current rate whichever is less. In case of such stores having been issued from SBI stores and returned by the contractor to stores, credit shall be given to him at the rates not exceeding those at which were originally issued to the contractor after taking into consideration and deduction for claims on account of any deterioration or damage while in the custody of the contractor and in this respect the decision of SBI /SBI/Architect shall be final.

32.0 Suspension of work: The contractor shall, on receipt of the order in writing of the SBI/Architect (whose decision shall be final and binding on the contractor) suspend the progress of works or any part thereof for such time and in such manner as SBI /Architect may consider necessary so as not cause any damage or injury to the work already done or endanger the safety thereof for any of following reasons.

- a) On account of any default on the part of the contractor, or
- b) For proper execution of the works or part thereof for reasons other than the default of the contractor, or
- c) For the safety of the works or part thereof.

The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the SBI /SBI/Architect.

i. If the suspension is ordered for reasons (b) and (c) in sub-Para (i) above:

The contractor shall be entitled to an extension of time equal to the period of every such suspension. No compensation whatsoever shall be paid on this account.

33.0 Action when the whole security deposit is forfeited: In any case in which under any clause or clauses of this contract, the Contractor shall have rendered himself liable to pay compensation amounting to the whole of his security deposit the Architect/Consultant shall have the power to adopt any of the following course as they may deem best suited to the interest of the SBI.

- a) To rescind the contract (of which rescission notice in writing to the contractor by the Architect/Consultant shall be conclusive evidence) and in which case the security deposit of the contractor shall be forfeited and be absolutely at the disposal of SBI.
- b) To employ labour paid by the SBI and to supply materials to carry out the work, or any part of the work, debiting the contractor with the cost of the labour, materials (the cost of such labour and materials as worked out by the SBI/Architect shall be final and conclusive against the contractor) and crediting him with the value of the work done, in all respects in the same manner and at the same manner and at the same rates as if it had been carried out by the contractor under the terms of this contract the certificate of Architect/Consultant as to the value of work done shall be final and conclusive against the contractor.

c) To measure up the work of the contractor, and to take such part thereof as shall be unexecuted, out of his hands, and to give it to another contractor to complete in which case any expenses which may be incurred in excess of the sum which would have been paid to the original contractor, if the whole work had been executed by him (of the amount of which excess the certificates in writing of the Architects/ Consultant shall be final and conclusive) shall be borne by original contractor and may be deducted from any money due to him by SBI under the contract or otherwise, or from his security deposit or the proceeds of sale thereof, or sufficient part thereof.

In the event of any of above courses being adopted by the SBI the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any material or entered into any engagements or make any advances on account of, or with a view to the execution of the work or the performance of the contract and in case the contract shall be rescinded under the provision aforesaid, the contractor shall not be entitled to recover or to be paid any sum or any work thereto for actually performed under this contract, unless, and until the Architect/Consultant/SBI will have certified in writing the performance of such work and the value payable in respect thereof, and he shall only be entitled to be paid the value so certified.

34.0 Owner's Right to Terminate the Contract: If the contractor being an individual or a firm commit any 'Act of Insolvency' or shall be adjusted an insolvent or being an incorporated company shall have an order for compulsory winding up voluntarily or subject to the supervision of Government and of the Official Assignee of the liquidator in such acts of insolvency or winding up shall be unable within seven days after notice to him to do so, to show to the reasonable satisfaction of the SBI /Architect that he is able to carry out and fulfil the contract, and to give security therefore if so required by the SBI.

Or if the contractor (whether an individual firm or incorporated Company) shall suffer execution to be issued or shall suffer any payment under this contract to be attached by or on behalf of any of the creditors of the contractor.

Or shall assign or sublet this contract without the consent in writing of the SBI through the Architect/Consultant or shall charge or encumber this contract or any payment due to which may become due to the contractor there under.

a) Has abandoned the contract; or

b) Has failed to commence the works, or has without any lawful excuse under these conditions suspended the progress of the works for 14 days after receiving from the SBI through the Architect/Consultant written notice to proceed, or

c) Has failed to proceed with the works with such diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon, or has failed to remove the materials from the site or to pull down and replace work within seven days after written notice from the SBI through the Architect/ Consultant that the said materials were condemned and rejected by the Architect/ Consultant under these conditions; or has neglected or failed persistently to observe and perform all or any of the acts, matters or things by this contract to be observed and performed by the contractor for seven days after written notice shall have been given to the contractor to observe or perform the same or has to the

detriment of good workmanship or in defiance of the SBI /SBI's or Architect's/Consultant's instructions to the contrary subject any part of the contract. Then and in any of said cases the SBI and or the Architect/Consultant, may not withstanding any previous waiver, after giving seven days' notice in writing to the contractor, determine the contract, but without thereby affecting the powers of the SBI or the Architect/Consultant or the obligation and liabilities of the contractor the whole of which shall continue in force as fully as if the contract had not been so determined and as if the works subsequently had been executed by or on behalf of the contractor. And, further the SBI through the Architect/Consultant, their agents or employees may enter upon and take possession of the work and all plants, tools, scaffoldings, materials, sheds, machineries lying upon the premises or on the adjoining lands or roads, use the same by means of their own employees or workmen in carrying on and completing the work or by engaging any other contractors or persons to complete the work and the contractor shall not in any way interrupt or do any act, matter or thing to prevent or hinder such other contractor or other persons employed for completing and finishing or using the materials and plant for the works. When the works shall be completed or as soon thereafter as convenient to the SBI or the Architect/Consultant shall give a notice in writing to the contractor to remove his surplus materials and plants and should the contractor fail to do so within 14 days after receipt thereof by him the SBI. /SBI sell the same by public auction after due publication and shall adjust the amount realized by such auction. The contractor shall have no right to question any of the acts of the SBI incidental to the sale of the materials etc.

35.0 Certificate of Payment:

The contractor shall be entitled under the certificates to be issued by the Architect/ Consultant to the contractor within 10 working days from the date of certificate to the payment from SBI from time to time. The SBI shall recover the statutory recoveries and other dues including the retention amount from the certificate of payment.

Provided always that the issue of any certificate by the Architect/Consultant during the progress of works or completion shall not have effect as certificate of satisfaction or relieve the contractor from his liability under clause.

The Architect/Consultant shall have power to withhold the certificate if the work or any part thereof is not carried out to their satisfaction.

The Architect/Consultant may by any certificate make any corrections required in previous certificate.

The SBI shall modify the certificate of payment as issued by the Architect/Consultant from time to time while making the payment.

The contractor shall submit interim bills only after taking actual measurements and properly recorded in the Measurement book (M.B).

The contractor shall not submit interim bills when the approximate value of work done by him is less than Rs..... and the minimum interval between two such bills shall be one month.

The final bill may be submitted by contractor within a period of one month from the date of virtual completion and Architect/Consultant shall issue the certificate of payment within a period of two months. The SBI shall pay the amount within a period of three months

from the date of issue of certificate provided there is no dispute in respect of rates and quantities.

The contractor shall submit the interim bills in the prescribed format with all details.

36.0 Settlement of Disputes and Arbitration:

Except where otherwise provided in the contract all questions and disputes relating to the meaning of the specifications, design, drawings and instructions herein before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the work or the execution or failure to execute the same, whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter :

- i) If the contractor considers that he is entitled to any extra payment or compensation in respect of the works over and above the amounts admitted as payable by the Architect or in case the contractor wants to dispute the validity of any deductions or recoveries made or proposed to be made from the contract or raise any dispute, the Contractor shall forthwith give notice in writing of his claim, or dispute to the Assistant General Manager (LB & RSETI)/Dy. General Manager (FI) and endorse a copy of the same to the Architect, within 30 days from the date of disallowance thereof or the date of deduction or recovery. The said notice shall give full particulars of the claim, grounds on which it is based and detailed calculations of the amount claimed and the contractor shall not be entitled to raise any claim nor shall the Bank be in any way liable in respect of any claim by the contractor unless notice of such claim shall have been given by the contractor to the Assistant General Manager (LB & RSETI)/Dy. General Manager (FI) in the manner and within the time as aforesaid. The contractor shall be deemed to have waived and extinguished all his rights in respect of any claim not notified to the Assistant General Manager (LB & RSETI)/Dy. General Manager (FI) in writing in the manner and within the time aforesaid.
- ii) The Assistant General Manager (LB & RSETI)/Dy. General Manager (FI) shall give his decision in writing on the claims notified by the contractor. The contractor may within 30 days of the receipt of the decision of the Assistant General Manager (LB & RSETI)/Dy. General Manager (FI) submit his claims to the conciliating authority namely the Circle Development Officer/General Manager (Official Language & Corporate Services) for conciliation along with all details and copies of correspondence exchanged between him and the Assistant General Manager (LB & RSETI)/Dy. General Manager (FI)
- iii) If the conciliation proceedings are terminated without settlement of the disputes, the contractor shall, within a period of 30 days of termination thereof shall give a notice to the concerned Chief General Manager/Dy. Managing Director (HR) & Corporate Development Officer of the Bank for appointment of an arbitrator to adjudicate the notified claims failing which the claims of the contractor shall be deemed to have been considered absolutely barred and waived.
- iv) Except where the decision has become final, binding and conclusive in terms of the contract, all disputes or differences arising out of the notified claims of the

contractor as aforesaid and all claims of the Bank shall be referred for adjudication through arbitration by the Sole Arbitrator appointed by the Chief General Manager at LHO /Dy. Managing Director & Corporate Development Officer at CC/CCEs. It will also be no objection to any such appointment that the Arbitrator so appointed is a technically competent person not below the rank of Superintending Engineer or equivalent position in Public Sector Banks / CPSEs, CPWD, LIC, RBI etc. If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another sole arbitrator shall be appointed in the manner aforesaid by the said Chief General Manager/ Dy. Managing Director (HR) & Corporate Development Officer. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

- v) It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each dispute along with the notice for appointment of arbitrator.
- vi) It is also a term of this contract that no person other than a person appointed by such Chief General Manager aforesaid should act as arbitrator.
- vii) The conciliation and arbitration shall be conducted in accordance with the provisions of the Arbitration & Conciliation Act 1996 or any statutory modification or re-enactment thereof and the rules made there under. viii) It is also a term of the contract that if any fees are payable to the arbitrator these shall be paid equally by both the parties.
- ix) It is also a term of the contract that the arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties calling them to submit their statement of claims and counter statement of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The fees if any, of the arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award (including the fees, if any of the arbitrator) shall be in the discretion of the arbitrator who may direct to any by whom and in what manner, such costs or any part thereof shall be paid and fix or settle the amount of costs to be so paid.

37.0 Water Supply: The contractor shall make his own arrangement for the water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions:

- i. That the water used of the contractor shall be fit for construction purposes to the satisfaction of the SBI/Architect / Consultant.
- ii. The contractor shall make alternative arrangements for the supply of water if the arrangement made by the contractor for procurement of water in the opinion of the Architect / Consultant is unsatisfactory. If the contractor uses water from the source of the employer, recover @0.5% of the bill for water charge shall be affected from the running bill of the contractor from time to time.

37.1. The contractor shall construct temporary well / tube well in SBI land for taking water for construction purposes only after obtaining permission in writing from the SBI. The contractor has to make his own arrangements for drawing and distributing the water at his own cost. He has to make the necessary arrangements. To avoid any accidents or damages caused due

to construction and subsequent maintenance of the wells. He has to obtain necessary approvals from local authorities, if required, at his own cost. He shall restore the ground to its original condition after wells are dismantled on completion of work or hand over the well to the SBI without any compensation as directed by the Architect / Consultant.

38.0 Power supply: The contractor shall make his own arrangements for power and supply/distribution system for driving plant or machinery for the work and for lighting purpose at his own cost. The cost of running and maintenance of the plants are to be included in his tender prices. He shall pay all fees and charges required for the power supply and include the same in his tendered rates and hold the owner free from all such costs. He has to obtain necessary approvals from the appropriate authorities, if required. If the contractor uses electrical power from the source of the employer, recover 0.5% of the bill for electricity consumption shall be affected from the running bill of the contractor from time to time.

39.0 Treasure Trove etc.: Any treasure trove, coin or object antique which may be found on the site shall be the property of SBI and shall be handed over to the SBI immediately.

40.0 Method of Measurement: Unless otherwise mentioned in the schedule of quantities or in mode of measurement, the measurement will be on the net quantities or work produced in accordance with up to date. Rules laid down by the Bureau of Indian standards. Measurement shall be as per units of measurement in specification. IS 1200 may be followed if there is any discrepancy. **For steel**, it shall be measured in weight in kg and no allowance is made in the weight for rolling margin. Wastage, binding wires shall not be measured. Authorized overlap, spacers, chairs shall only be measured.

Both cement and steel consumption statement shall be submitted along with bill. Co-efficient for Cement consumption shall be as per CPWD. In the event any dispute/disagreement the decision of the Architect/Consultant shall be final and binding on the contractor

41.0 Maintenance of Registers: The contractor shall maintain the following registers as per the enclosed format at site of work and should produce the same for inspection of SBI /Architect/Consultant whenever desired by them. The contractor shall also maintain the records/registers as required by the local authorities/Government from time to time.

42.0 PRICE VARIATION ADJUSTMENT (PVA) FOR ALL MATERIALS (INCLUDING CEMENT & STEEL) & LABOUR

(Only Applicable if the date of issue of work order or handover of site period beyond six (06) months from the last date of tender submission)

In partial modification of the provisions made elsewhere in this contract regarding rate quoted being not subject to any variations, price adjustments to the value of work payable to the Contractor at tendered rates shall be made towards variations in the prices of materials and labour in the manner specified hereunder:-

If, after written order to commence the work and during the operative period of this contract including any authorized extensions of the original stipulated completion period:-

(a) There be any variation in the Consumer Price Index- General Index- for industrial workers (Base 1982=100) (source – data published from time to time Indian Labour Journal by the Labour Bureau, Government of India);

OR

(b) There be any variation in the All India Wholesale Price Index for all commodities (Base 199394=100) (as published from time to time in the RBI Bulletin based on the date issued by the Office of the Economic Advisor to the Government of India);

Price Variation Adjustment (PVA) towards (1) Labour Component and (2) Material Component shall be calculated in accordance with the formula A and B respectively, given below, subject to stipulations herein under mentioned:-

FORMULA (A) FOR LABOUR:

$$VL = 0.85P \times \frac{K1 \times (C1 - C0)}{100C0}$$

FORMULA (B) FOR MATERIALS:

$$VM = 0.85X \frac{(P-Y) \times K2 \times (I1 - I0)}{100 I0}$$

Where-

VL = Amount of Price Variation Adjustment
Increase or decrease in rupees due to labour component

VM = Amount of Price Variation Adjustment
Increase or decrease in rupees on account of materials component

NOTE: Bill period (noted hereunder) signifies the period of actual execution and not date of measurement or preparation of bill.

P = Cost of work done during the period under consideration (bill period) excluding advances on materials and/or adjustments thereof.

Y = Cost of any other materials supplied/ arranged by the Bank at fixed price during the period under consideration (bill period)

K1 = Percentage of labour component calculated as indicated in Note (1) below

K2 = Percentage of materials component as indicated in Note (2) below.

CO = Consumer Price Index – General Index Number for industrial workers (Base 1982 = 100) referred to at (a) above, ruling on the last due date of receipt of tenders, and as applicable to the centre, nearest to the place of work, for which the index is published)

C1 = Average of above mentioned Consumer Price Index number during the period under consideration (bill period)

I0 = All India Wholesale Price Index number for all commodities referred to at (b) above, ruling on the last date for receipt of tenders and as applicable to the centre, nearest to the place of work for which the index is published.

I1 = Average of above mentioned monthly all India Wholesale Price Index numbers during the period under consideration (bill period)

NOTE (1) : K1 shall be taken as under:-

<u>Component of work</u>	<u>K 1</u>
a) Civil work including ancillary works and external work and RCC / tanks, septic tanks, etc. if any of sanitary and plumbing work	30
b) Sanitary and plumbing works including fittings and fixtures (internal work only)	20
c) Electrical installations work including fittings and fixtures (external and internal works)	20

NOTE (2) : K2 shall be taken as under:-

<u>Component of work</u>	<u>K 2</u>
a) Civil work including ancillary works as detailed under Note (1) (a) above	70
b) Sanitary and plumbing works including fittings and fixtures as detailed under Note (1) (b) above	80
c) Electrical installations work including fittings and fixtures as detailed under Note (1) (c) above	80

Stipulations:

- (i) PVA Clause is operative either way i.e. if the variations in above referred price indices are on the plus side. PVA shall be payable to the contractor and if they are on the negative side PVA shall be recoverable from the contractor for the respective bill period of occurrence of fluctuations.
- (ii) The rates quoted by the Contractor shall be treated as firm for the value of work required to be done in the first 12 months of the contract period from

the date of written order to commence work and no PVA is admissible on the same on any grounds whatsoever. The value of work required to be done during the first 12 months of the contract period shall be taken as 80% of the value of work to be done on pro-rata basis in 12 months as compared to the total stipulated completion period. No PVA is admissible on the value of work required to be done in first 12 months as worked out above, even if this value of work is actually done in a period longer than 12 months. However, in case of any delay in the first 12 months due to genuine reasons which are not attributable to the contractor and which are beyond his control, such period of delay will be deducted from 12 months, and the value of work to be done will be 80% of the pro-rata value of work to be done in such reduced period on pro-rata basis.

- (iii) (a) For works where the original stipulated period of completion is not more than 12 months, no PVA whatsoever is permissible under this clause. However, if the period of completion is delayed beyond 12 months on account of genuine reasons which are not attributable to the contractor and which are beyond his control, PVA will be admissible on the value of work done only in excess of value of work required to be done on a pro-rata basis in the first 12 months minus the period of such genuine delay.

(b) For purpose of admissibility of PVA all the cumulative period of extensions granted for reasons which are solely attributable to the contractor is excluded from the total extended period of the contracts and PVA shall not be admissible on the value of work done during such period of extensions, which are granted for keeping the contract current, but only due to reasons for which the contractor was solely responsible. Periods of extensions granted on account of genuine reasons which are not attributable to the contractor and which are beyond his control will however, be included in the period for which PVA is admissible.

(c) Notwithstanding anything to the contrary mentioned in any other clause/ clauses of the contract, extensions of the contract period shall be granted by the Architect only with prior approval of the Bank. Extensions granted by the Architect without Bank's prior approval shall not bind the Bank for payment of PVA for work done in the concerned period of extensions.

- (iv) (a) Where the total cost of work done beyond the value of work required to be done in the first 12 months (vide note (ii) and (iii) above does not exceed Rs.50 lacs the total amount of PVA worked out on the basis of provisions of foregoing stipulations will be limited to an upper ceiling of 10% of such value of work done in excess of value of work required to be done in the first 12 months, minus the cost of any materials issued/arranged by the Bank at fixed prices i.e. $P - Y$ (these terms being as per definitions given formulae A and B above).

(b) Where the total value of work done beyond the value of work required to be done in the first 12 months exceeds Rs.50 lacs, the PVA on the first Rs.50 lacs will be calculated as provided for in the foregoing para and for the balance value of work done for which PVA is admissible subject to foregoing conditions, the PVA will have the upper ceiling of 10% but it will be worked out at a lower rate i.e. 80% of the amount worked out as per the formulae A and B referred to earlier.

- (v) In working out the amount of PVA as per all the foregoing stipulations, value of such extra items or such portions of extra items the rates of which are derived from the prevailing market rates of materials and labour will not be included in the value of work done. Value of only such extra items or such portions of extra items, rates of which are derived entirely from tendered rates will be included in the value of work on which PVA as calculated.
- (vi) For claiming the payment for PVA the contractor shall keep such books of accounts and other documents, vouchers receipts etc. as may be required by the Bank/Architect, for verification of the increased claims or reduction to be made as the case may be and he shall also allow Engineers and/or other duly authorized representatives of the Bank/Architects and furnish such information as may be required or called for to enable verification of the claim within a week of such request.
- (vii) The contractor is required to submit to the Bank, through the Architect, his claims for PVA separately for each running Bill for the individual bill periods for the work paid to him by the Bank. He will also be required to submit detailed calculations in support of the claims.
- (viii) No claim will be entertained from the contractor for interest or any other grounds for nonpayment or for any delay in payment of PVA due to late publication or non-availability of the necessary price indices or due to delay in preparation of the Running or Final Bills.
- (ix) In view of adjustments for variations in process of materials and labor which have been covered in this clause no other adjustments for any reason whatsoever like statutory measures, taxes, levies, etc. will be allowed.

43.0 Force Majeure:

43.1 Neither contractor nor SBI shall be considered in default in performance of their obligations if such performance is prevented or delayed by events such as war, hostilities revolution, riots, civil commotion, strikes, lockout, conflagrations, epidemics, accidents, fire, storms, floods, droughts, earthquakes or ordinances or any act of god or for any other cause beyond the reasonable control of the party affected or prevented or delayed. However a notice is required to be given within 30 days from the happening of the event with complete details, to the other party to the contract, if it is not possible to serve a notice, within the shortest possible period without delay.

43.2 As soon as the cause of force majeure has been removed the party whose ability to perform its obligations has been affected, shall notify the other of such cessation and the actual delay incurred in such affected activity adducing necessary evidence in support thereof.

43.3 From the date of occurrence of a case of force majeure obligations of the party affected shall be suspended during the continuance of any inability so caused. With the cause itself and inability resulting there from having been removed, the agreed time of completion of the respective obligations under this agreement shall stand extended by a period equal to the period of delay occasioned by such events.

43.4 Should one or both parties be prevented from fulfilling the contractual obligations by a state of force majeure lasting to a period of 6 months or more the two parties shall mutually decide regarding the future execution of this agreement.

44.0 Local Laws, Acts, Regulations: The contractor shall strictly adhere to all prevailing labour laws inclusive of contract labour (regulation and abolition act of 1970) and other safety regulations. The contractor shall comply with the provision of all labour legislation including the latest requirements of all the Acts, laws, any other regulations that are applicable to the execution of the project.

- i) Minimum Wages Act, 1948 (Amended)
- ii) Payment of Wages Act 1936 (Amended)
- iii) Workmen's Compensation Act 1923 (Amended)
- iv) Contract Labour Regulation and Abolition Act 1970 and Central Rules 1971(Amended)
- v) Apprentice Act 1961 (Amended)
- vi) Industrial Employment (Standing Order) Act 1946 (Amended)
- vii) Personal Injuries (Compensation Insurance) Act 1963 and any other modifications
- viii) Employees' Provident Fund and Miscellaneous Provisions Act 1952 and amendment thereof
- ix) Shop and Establishment Act
- ix) Any other Act or enactment relating thereto, and rules framed there under from time to time.

45.0 SAFETY CODE & MEASURES AT SITE:

1. All personnel at site should be provided with Helmets and Safety Boots with some Identification Mark. Visitors also should be provided with Helmets. It should be ensured that these are used properly.
2. First Aid Box should be kept at site with all requisite materials.
3. No one should be allowed to inspect / work at a height without Safety Belt.

4. Suitable scaffolds should be provided for workmen for all Works that cannot safely be done from the ground, or from solid construction except such short period Work as can be done safely from ladders. When a ladder is used an extra Mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well as suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than $\frac{1}{4}$ to 1 ($\frac{1}{4}$ horizontal and 1 vertical).
5. Scaffolding or staging more than 3.5 meters above the ground or floors, swung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise secured at least 1 Meter high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
6. Working platforms, Gangways, and Stairways should be so constructed that they do not sag unduly or unequally, and if the height of the platform or the Gangway or the Stairway is more than 3-5 Meters above ground level or floor level they should be closely boarded, should have adequate width and should be suitably fenced, as described.
7. 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 1 Meter.
8. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 Meters in length while the width between side rails in rung ladder shall in no case be less than 30cms for ladder up to and including Meters in length. For longer ladders this width should be increased at least 6mm for each additional 30 CMS. Uniform step spacing shall not exceed 30 CMS.
9. Adequate precautions shall be taken to prevent danger from electrical equipment. For electrical on line works gloves, rubber mats, and rubber shoes shall be used.
10. All trenches 1.2 Meters or more in depth shall at all times be supplied with at least one ladder for each 30 Meters length or fraction thereof. Ladder shall be extended from bottom of the trench to at least 1 Meter above the surface of the ground. The sides of the trenches, which are 1.5 Meters or more in depth shall be stepped back to give suitable slope, or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5 Meters of the edge of the trench or half of the depth of the trench whichever is more cuttings shall be done from top to bottom. Under no circumstances undermining or under cutting shall be done.
11. Before any demolition work is commenced and also during the process of the work: -
 - a) All roads and open areas adjacent to the Work Site shall either be closed or suitably protected;
 - b) No electrical cable or apparatus which is liable to be a source of danger over a cable or apparatus used by the operator shall remain electrically charged.
 - c) All practical steps shall be taken to prevent danger to persons employed from risk or fire or explosion or flooding. No floor, roof or other part of the building shall be so over-loaded with debris or materials as to render it unsafe.

- d) All necessary personal safety equipment as considered adequate by the Site Engineer should be kept available for the use of the persons employed on the Site and maintained in a condition suitable for immediate use; and the Contractor should take adequate steps to ensure proper use of equipment by those concerned.
- e) Workers employed on mixing Asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.
- f) Those engaged in white washing and mixing or stacking of cement bags or any materials which is injurious to the eyes shall be provided with protective goggles.
- g) Those engaged in welding works shall be provided with Welder's protective eye-shields.
- h) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
- i) When workers are employed in sewers and manholes, which are in use, the Contractor shall ensure that the manhole covers are opened and are ventilated at least for an hour before the workers are allowed to get into the manholes and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals and boards to prevent accident to the Public.
12. Use of hoisting machines and tackle including their attachments, anchorage and support shall conform to the following standard or condition: -
- a) These shall be of good mechanical construction, sound material and adequate strength and free from patent defect and shall be kept in good repairs and in good working order.
- b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from patent defects.
- c) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in-charge of any hoisting machine including any scaffold, winch or give signals to the operator.
- d) In the case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or lowering or as means of suspension the safe working load shall be ascertained by adequate means.
- e) Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load, each safe working load of the conditions under which it is applicable shall be clearly indicated. No part of any machine or of any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.
- f) Motor, Gearing, Transmission, Electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards, hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load, adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced.

g) When workers are employed on electrical installation, which is already energized, insulating mats, wearing apparel such as gloves, rubber footwear etc.

46.0 Accidents: The contractor shall immediately on the occurrence of any accident at or about the site or in connection with the execution of the work report such accident to the Architect/Consultant. The contractor shall also report immediately to the competent authority whenever such report is required to be lodged by the law and take appropriate actions thereof.

47. Assignment Subletting: The whole of the works included in the contract shall be executed by the composite contractor and the same shall not directly or indirectly transfer, assign or underlet therein without the written permission of the bank and no undertaking shall relieve the contractor from any liability or obligation under the contract. No subletting of the work is permitted.

48. BANK'S BUILDING PROJECTS-MAINTENANCE OF RECORDS AT SITE OFFICE

A.	Registers at the site office
1	Measurement Books.
2	Cement Register (Daily Record).
3	Steel Register.
4	Steel Consumption Register – Bill wise.
5	Drawings register
6	Materials at site register.
7	Hindrance Register.
8	Concrete cube Test Register.
9	File and Register for extra / variation items.
10	Materials test Register and File.
11	Site Order Book (in triplicate).
12	Lead caulking Register.
13	Labour Reports and progress Reports Register.
14	Site Visit & Instructions Register.
15	Certified true copies of the contracts.
16	Format for Bar Bending Schedule (BBS)

SPECIAL CONDITIONS OF THE CONTRACT (SCC)

1	<p>Dimensions and levels: All dimensions and levels shown on the drawings shall be verified by the contractor on the site and he will be held responsible for the accuracy and maintenance of all the dimensions and the levels. Figured dimensions are in all cases to be accepted and no dimension shall be scaled. Large-scale details shall take precedence over small-scale drawings. In case of discrepancy, the contractor shall ask for clarification from the Architect / Consultant before preceding the work.</p>
2	<p>Notice of Operation: The contractor shall not carry out any important operation without the consent in writing from the Architect / Consultant.</p>
3	<p>Construction Records: The contractor shall keep and provide to the Architect / Consultant full and accurate records of the dimensions and positions of all new work and any other information necessary to prepare complete drawings recording details of the work as constructed.</p>
4	<p>Safety of Adjacent Structures and Trees: The contractor shall provide and erect to the approval of the Architect / Consultant such supports as may be required to protect effectively all structures and protective guards to trees which may be endangered by the execution of the works or otherwise take such permanent measures as may be required by the Architect to protect the trees and structures.</p>
5	<p>Site Order Book: A site order book shall be maintained at the site for the purpose of quick communication between the Architect / Consultant. Any communication relating to the works may be conveyed through records in the site order book. Such a communication from one party to the other shall be deemed to have been adequately served in terms of the contract. Each site order book shall have machine numbered pages in triplicate and shall be carefully maintained and preserved by the contractor and shall be made available to the Architect / Consultant as and when demanded. Any instruction which the Architect / Consultant may like to issue to the contractor or the contractor may like to bring to the Architect / Consultant two copies of such instructions shall be taken from the site order book and one copy will be handed over to the party against proper acknowledgement and the second copy will be retained for their record.</p>
6	<p>Temporary Works: Before any temporary works are commenced the contractor shall submit at least 7 days in advance to the Architect / Consultant for approval complete drawings of all temporary works he may require for the execution of the works. The contractor shall carry out the modifications relating to strength, if required by the Architect / Consultant may require in accordance with the conditions of the contract at his own cost. The contractor shall be solely responsible for the stability and safety of all temporary works and unfinished works and for the quality of the permanent works resulting from the arrangement eventually adopted for their execution.</p>
7	<p>Water, Power and Other Facilities:</p>
7.a	<p>The rate quoted by the contractor shall include all expenses that are required for providing all the water required for the work and the contractor shall make his own arrangements for the supply of good quality water suitable for the construction and good quality drinking water for their workers. If necessary, the contractor has to</p>

	sink a tube well / open well and bring water by means of tankers at his own cost for the purpose. The SBI will not be liable to pay any charges in connection with the above.
7.b	The rate quoted in the tender shall include the expenses for obtaining and maintaining power connections and shall pay for the consumption charges.
7.c	The contractors for other trades directly appointed by the SBI shall be entitled to take power and water connections from the temporary water and power supply obtained by the contractor. However, the concerned contractor shall make their own arrangements to draw the supply and pay directly the actual consumption charges at mutually agreed rates between them. All municipal charges for drainage and water connection for construction purposes shall be borne by the contractor and charges payable for permanent connections if any, shall be initially paid by the contractor and the SBI will reimburse the amount on the production of receipts.
7.d	The SBI as well as the Architect / Consultant shall give all possible assistance to the contractors to obtain the requisite
7.e	Permission from the various authorities, but the responsibility for obtaining the same in time shall be of the contractor
7.f	If the contractor uses water/ electrical power from the source of the employer, recover @0.5% for water charge and 0.5% for electricity consumption shall be affected from the running bill of the contractor from time to time
8	Office Accommodation
8.a	The contractor shall provide and maintain all necessary offices, workshops, stores, shelters, sanitary facilities, canteens, and other temporary structures for themselves in connection with the work at the site at their own cost after getting the approval from the Architect / Consultant.
8.b	A site office for the use of SBI / Consultant shall be provided by the contractor at his own expense.
8.c	All temporary buildings and facilities as mentioned above shall be removed on completion of the work or any other earlier date as directed by the Architect / Consultant. All the expenses for obtaining statutory approvals and maintenance of the above facilities as well as running expenses shall be borne by the contractor at no extra cost. It is also the responsibility of the contractor to obtain statutory approvals for providing the above facilities.
9	Facilities for Contractor's employees: The contractor shall make his own arrangement for the housing and welfare of his staff and workmen including adequate drinking water facilities. The contractor shall also make the arrangements at his own cost for transport where necessary for his staff and workmen to and from site of work at his own cost.
10	Lighting of works: The contractor shall at all times provide adequate and approved lighting as required for the proper execution and supervision and inspection of work.
11	Firefighting arrangements
11.a	The contractor shall provide a suitable arrangement for firefighting at his own cost.

	For this purpose, he shall provide requisite number of fire extinguishers and adequate number of buckets, some of which are to be always kept filled with sand and some with water. This equipment shall be provided at suitable prominent and easily accessible places and shall be properly maintained.
11.b	Any deficiency in the fire safety or unsafe conditions shall be corrected by the contractor at his own cost and with the approval of the relevant authorities. The contractor shall make the following arrangements at his own cost but not limited to the following.
11.c	Proper handling, storage, and disposal of combustible materials and waste. Work operations that can create fire hazard. Access to firefighting equipment, type, number and location of containers for the removal of surplus materials and rubbish. Type, size, number, and location of fire extinguishers or other firefighting equipment. General housekeeping.
12	Temporary Fencing / Barricading: The contractor shall provide and maintain a suitable temporary fencing / barricading and gates at his cost to adequately enclose all boundaries of the site for the protection of the public and for the proper execution and security of the work and in accordance with the requirement of the Architect / Consultant and regulations of local authorities. These shall be altered, relocated and adopted from time to time as necessary and removed on completion of the work.
13	Site Meetings: Site meetings will be held to review the progress and quality evaluation. The contractor shall depute a senior representative along with the site representative and other staff of approved sub-contractors and suppliers as required to the site meetings and ensure all follow up actions. Any additional review meetings shall be held if required by the Architect / Consultant.
14	Disposal of Refuse: The contractor shall cart away all debris, refuse etc. arising from the work from the site and deposit the same as directed by the Architect / Consultant at his own cost. It is the responsibility of the contractor to obtain from the local authorities concerned to the effect that all rubbish arising out of contractor's activities at the construction site or any other off-site activities borrow pits has been properly disposed of.
15	Contractor to Verify Site Measurement: The contractor shall check and verify all site measurements whenever requested by other specialists' contractors or other sub-contractors to enable them to prepare their own shop drawings and pass on the information with sufficient promptness as will not in any way delay the works.
16	Bar Bending Schedule: The contractor shall prepare a detailed bar bending schedule for all reinforced concrete works and get them approved by the Architect / Consultant well in advance.
17	As-built drawings:
17.a	The Architect / Consultant will issue two sets of drawings to the contractor for the items for which some changes have been made from the approved drawings as instructed by the SBI / Architect / Consultant. The contractor will make the changes made on these copies and return these copies to the Architect / Consultant for their approval. In case any revision is required or the corrections are not properly marked the Architect / Consultant will point out the discrepancies to the contractor.

	The contractor will have to incorporate these corrections and / or attend to discrepancies either on the copies as directed by the Architect / Consultant and resubmit to him for approval. The Architect / Consultant will return one copy duly approved by him.
17.b	For the drawings prepared by the contractor. The contractor will modify the drawing prepared by him wherever the changes are made by the SBI / Architect / Consultant and submit two copies of such modified drawings to the Architect / Consultant for approval. The Architect / Consultant will return one copy of the approved drawing to the contractor.
18	Approved make: The contractor shall provide all materials from the list of approved makes at his own cost and also appoint the specialized agency for the waterproofing anti-termite, aluminum doors and windows and any other item as specified in the tender. The Architect / Consultant may approve any make / agency within the approved list as given in the tender after inspection of sample / mock up.
19.	Procurement of materials: The contractor shall make his own arrangements to procure all the required materials for the work. All wastage and losses in weight shall be to the contractor's account.
20	Excise duty, taxes, levies etc.: The contractor shall pay and be responsible for payment of all taxes, duties, levies, royalties, fees, cess or charges in respect of the works including but not limited to sales tax, tax on works contract excise duty, and octroi, payable in respect of materials, equipment plant and other things required for the contract. All of the aforesaid taxes, duties, levies, fees and charges shall be to the contractor's account. Variation of taxes, duties, fees levies etc. if any, till completion of work shall be deemed to be included in the quoted rates and no extra amount on this account. Variation of taxes, duties, fees, levies etc if any, till completion of work shall be deemed to be included in the quoted rates and no extra claim on this account will in any case be entertained. If a new tax or duty or levy or cess or royalty or octroi is imposed under as statue or law during the currency of contract the same shall be borne by the contractor.
21	Acceptance of Tender: The SBI shall have right to reject any or all tenders without assigning any reason. They are not bound to accept the lowest or any tender and the tenderer or tenderers shall have no right to question the acts of the SBI.
22	Progress report shall be submitted monthly: The contractor shall furnish Bar chart/PERT chart for completion of work within stipulated time that is within 7 days of issue of LOI/ WO. This will be got approved from architect/Bank. The approved bar/PERT chart shall form a part of agreement. Achievement of miles stones as well as total completion has to be within the time period allowed, that is 18 calendar months. Contractor shall mobilize and employ sufficient resources for completion of all the works as indicated in the agreed BAR chart/ Network. During the currency of the work, the contractor is expected to adhere to the time schedule on miles stone and total completion and his adherence will be a part of contractor's performance under the contract.
23	Centring & Shuttering: Plywood conforming to IS:4990 or steel plates of minimum thickness as approved

	by architect / EIC shall be used for formwork. The shuttering ply/plates shall be cleaned and oiled after every repetition and shall be used only after obtaining approval of architect/ EIC at site. The number of repetitions allowed for plywood and steel shuttering shall be at the discretion of EIC/ architect depending upon the conditions of shuttering surface after each use and the decision of architect/ EIC in this regard shall be final and binding on the contractor. No claim whatsoever account shall be admissible.
24	Photograph: Site photographs of reinforcement of foundations, columns, beams, slabs, RCC walls shall be submitted to the architect/ EIC (one copy shall be attached during submit of bills). Photographs of concreting shall also be submitted.
25	Reports and returns: The contractor shall maintain at-site records of the progress of work with regard to the works carried out. Contractor shall submit fortnightly / monthly (as directed by architect/ EIC) progress reports (Two copies) highlighting status of various activities and physical completing of the work. These will be used as the basis for the preparation of measurements which are to be furnished to the architect / employer regularly in the form of progress report forms (Bar chart including %age of completion, hurdles, etc. Enlarged site photographs shall also be submitted.
26	Government and local rules: The contractor shall conform to the provisions of all local bye-laws and acts relating to the work and to the regulations etc., of the govt and local authorities and of any company with whose system the structure is proposed to be connected. The contractor shall give all notices by said act, rules, regulations and bye-laws etc and pay all fees payable to such authority/authorities for execution of work involved. The cost, if any, shall be deemed to have been included in his quoted rates, taking into account all liabilities for licenses, fees, for footpath encroachment and restoration etc and shall indemnify the employer against such liabilities and shall defer all actions arising from such claims or liabilities.
27	Provisional Sum (PS): All provisional sum described in the schedule of quantities as P.S. shall be exclusively allotted to the purchase of materials and not for handling and fixing to be done by the contractor. Such cost of handling and fixing with profit including transportation charge required shall be separately included in the contract price as described in SOQ. The disposal of the amounts covered under the head will be absolutely at the discretion of the employer. Contractor is to make payments for these materials to the suppliers on certificate basis or order issued by the employer /architect and realize then through his bills from the employer.
29	Removal of improper works: The employer shall during the progress of work have power to order in writing from time to time. The removal from the works within such reasonable time or times as may be specified in the order of any materials which in the opinion of architect/employer are not in accordance with the specification or the instructions the substitution or proper execution of any work executed with materials or workmanship not in accordance with the drawings and specifications or instructions. No certificate which may be given by the architect shall relieve the contractor from his liability in respect of unsound work.

30	<p>Account receipt and vouchers: The contractor shall upon the request of the employer furnish them with all the invoices, accounts, receipts and other vouchers that they may require in connection with the works under this contract. If the contractor uses materials less what is required under the contract, the value of difference in the quantity of materials he was required to use and that he actually used shall be deducted from his dues. Similarly, if the contractor uses cement and steel more than the requirement, the excess cement/steel used (5% wastage will be considered) will be reimbursed to contractor upon production of vouchers (excluding GST). The employer decision shall be final and binding on the contractor as to the mount of materials the contractor is required to use for any work under this contract.</p>
31	<p>Escalation: The rate quoted shall be firm throughout the tenure of the contract (inclusive of extension of time If any granted) and will not be subject to any fluctuation due to increase in cost of materials, labour, taxes, octroi, transportation on work contract unless specifically provided in these documents.</p>
32	<p>Drawings and specifications: The contractor shall be furnished by the architect free of cost one sets of each of the drawings, specifications, descriptions of schedules and other details necessary for execution of work. The contractor shall provide all his cost everything for the proper execution of works according to the intents and meaning of drawing, schedule, specification taken together whether same may or may not be shown or described therein provided that the same reasonably inferred therefrom and if the contractor finds any discrepancy in the drawings or between drawings, schedule of quantities and specifications, he shall immediately and in writing refer the same to the architect. The decision of architect/ employer shall be final and binding. Reinforcing steel and bar bending shall be furnished by the contractor to the architect / employer at least 10 days before the items of work to be taken up and approval of the architect/employer shall be obtained before fabrication and placing of reinforcement. Shuttering and tagging drawings if called by architect/employer shall be furnished well in advance for his approval before taking up the work</p>
33	<p>Abandonment- curtailment of work: If at any time after issue of WO, the employer for any reason whatsoever not required part or whole of the work as specified in the contract to be carried out, the architect/employer shall give notice in writing of the fact to the contractor who shall have no claim to payment of any compensation whatsoever on account of profit or advantage which he might have derived from the execution of work in full, provided that the contractor will be paid transport charges of any Bonafede materials actually brought at site and rendered surplus abandonment or curtailment and there taken back by the contractor, the quality and kid of such material rendered surplus is to be certified by the architect whose decision shall be final and binding.</p>
34	<p>Payment withheld: The Bank's engineer may withheld the amount on account of a subsequent discovered evidence nullify the whole or part of any certificate to such extent as may be necessary in his opinion to protect the employer from loss on account of: a). Defective work not remedied; b). Failure of the contractor to make payment properly to sub-contractor for materi-</p>

	<p>als or labour or supplier,</p> <p>c). A reasonable doubt that the contract can be completed for the balance then unpaid,</p> <p>d). Damages to another contractor or sub-contractor, claims filed or reasonable evidence indicating probable fillings of claims. When grounds are removed, payment shall be made for amounts withheld because of them.</p>
35	<p>Advance payments: No advance payment will be made to the contractor. The Bank does not have any provision for sanctioning any mobilization advance whether secured or unsecured.</p>
36	<p>Inspection of work The proposed work covered under this tender during its progress can also be inspected by the Chief Technical Examiner/ Technical examiner or by an officer of the vigilance cell of authority on behalf of the Bank.</p>
37	<p>Failure by contractor to comply with Bank's/ Architect instructions: If the contractor after receipt of written notice from the bank and / or the architect requiring compliance within 10 days fails to comply with such further drawings and/or Bank's /architects instructions, the Bank through the architect or other person, may employ other person to execute any such work whatsoever that may be necessary to give effect thereto and pay all cost incurred in connection therewith and same shall be recoverable from the contractor by the bank on the certificate of the architect as a debt or shall have right to deduct same from any moneys due to or to become due to contractor</p>
38	<p>Permits, licences and possession prior to completion: Permits and licences that are required to execute this work which are under government control, will be arranged by the contractor. The Bank will render necessary assistance, sign any forms or applications that may be necessary. The Bank shall have right to take possession of or use any completed or partially completed part of the work. Such possession or use shall not be an acceptance of any work not completed in accordance with the contract agreement.</p>
39	<p>Guarantee for the specialized works: Whether provision for submission of a guarantee has been advised, the same shall be submitted from the specialized agency along with counter guarantee by the main contractor engaged for the work. The guarantee shall be furnished on a non-judicial stamp paper of appropriate value. If the contractor is required to submit the guarantee for any item/items for a period of more than 12months, the guarantee in case of those items will be valid after expiry of the Defect Liability Period of 12 months as stipulated in contract.</p>
40	<p>Tests, results and site register: The contractor is required to maintain the following registers at site of work and should produce the same for inspection of the Bank/architect whoever desired by them: Sieve analysis of coarse aggregate, fine aggregate, silt content of fine aggregate, cube and slump test of concrete, procurement of cement and steel register, hindrance and site register etc.</p>
41	<p>IT/CESS/Other tax, as applicable, shall be deducted from the bill of the contractor as per Govt rule.</p>

42	<p>Agreement: The contractor shall execute the agreement as per draft agreement within 15 days of issue of WO. He shall pay all stamp and legal expense incidental thereto. However, the written acceptance of the tender by the employer/ consultant on behalf of employer will constitute a binding contract between the employer and the person so tendering whether such formal agreement is or is not subsequently executed.</p>
43	<p>No compensation for alteration in or restriction of work to be carried out: If at any time after the commencement of work, it is felt by the Bank/architect for any reason whatsoever, not require the whole work thereof as specified in the tender to be carried out, the architect/bank shall give notice in writing of the fact to the contractor who shall have no claim to any payment or compensation whatsoever on account of any profit or advantage with which he might have derived from the execution of work in full, but which he did not derive in consequences of the full amount of work not having been carried out: neither he shall have claim for compensation by reason of any alteration having been made in the original specification, drawing, design, and instructions which shall involve any curtailment of the work as originally contemplated.</p>
44	<p>Declaration: I/we have inspected the site of works and have made me/us fully acquainted with the local conditions in and around the sites of works. I/we hereby declare that I/we have gone through the conditions laid down in the NIT. GCC, SCC and additional terms and conditions, drawings, and specifications and understood the said, and in the basis of the same I/we quoted rates in SOQ attached with the tender document (Called price bid including reverse auction if any) I/we shall also uniformly maintain such progress with the work as may be directed by the Bank/architects to ensure completion of same within the target date as mentioned in the tender document.</p>
45	<p>Contractor to provide everything necessary: The contractor shall provide everything necessary for the proper execution of the work according to the intent and meaning of the drawings, schedule of quantities, and specifications are taken together whether the same may or may not be particularly shown or described therein provided that the same can reasonably be inferred therefrom and if the contractor finds and discrepancies therein, he shall immediately and in writing refer the same to the architect and employer whose decision shall be final and binding. The contractor shall provide himself with ground and fresh water for carrying out the works at his own cost. Rates quoted against individual items will be inclusive of everything necessary to complete the said items of work within the contemplating of the contract and beyond the unit price to extra payment will be allowed for incidental or contingent work, labour, and or materials, inclusive of all taxes and duties whatsoever except for specific items if any stipulated in the tender document.</p>
46	<p>Tenders: The works will be paid for as "Measured work" on the basis of actual work done and not a lumpsum contract. The tender is strictly on percentage rate basis and it should be workable and self-supporting. Details analysis shall be submitted by the contractor if called upon by the architect/ employer. The employer/architects shall not be bound to recognize the contractors' analysis. All items of work described in the Schedule of Quantities/BOQ are to be deemed and paid as complete works in all respects and details including preparatory and</p>

	<p>finishing works involved, directly, related, to and reasonably detectable from drawings, specifications, and schedule of quantities and no further charges in the tender in respect of any item of works, the payment of such items of work will be made for the actual work done on the basis of lumpsum charges as will be assessed to be payable by the employer/architect.</p> <p>The employer has power to add or to omit from any work as shown in drawings or described in specifications or included in the schedule of quantities and intimate the same in writing but no addition, omission or variation shall be made by the contractor without authorization from the employer. No variation shall vitiate the contract.</p>
47	<p>Other persons engaged by the employer: The employer reserves the right to execute any part of work included in the contract or any work which is not included in this contract by other agency or persons and the contractor shall allow all reasonable facilities and use of his scaffolding for the execution of such work. The main contractor shall extend all cooperation in this regard.</p>
48	<p>Tools, storage materials, protective works, and site office requirements:</p> <p>The contractor shall provide, fix up and maintain in an approved position proper office accommodation for the contractor's representative and staff to receive instructions notices or communications and clear away on completion of the works and make good all works disturbed. Temporary hut for the watchman and clear away when no longer required and to provide all necessary attendance lights etc required shall be provided. Temporary latrines for workers and field staff and keep the same in a clean and sanitary condition to the satisfaction of public health authorities.</p> <p>The contractor shall indemnify the employer against any possible damages to the building, roads or members of the public in course of execution of the work.</p> <p>The contractor shall provide and maintain proper sheds for the proper staging and adequate protection of the materials etc and other works that may be executed on the site including tools, and materials of sub-contractor removal of shade after completion of work.</p>
49	<p>Notice and patents of appropriate authority and banks:</p> <p>The contractor shall conform to the provision of acts of legislation relating to the work and to the regulation and bye-laws of any authority, and or any water, lighting, and other companies and/or authorities with whose systems the structures were proposed to have connection and shall before making any variations from the drawings or specifications that may be associated to so conform give employer/architects written notices specifying the variations proposed to be made and the reasons for making them and apply for instruction thereon. The employer/architect on receipt of such intimation shall give a decision within a reasonable time.</p> <p>The contractor shall arrange to give notices requires for by the said acts, regulations or bye-laws to be given to any authority and to pay such authority or to any public officer all fees that may be properly chargeable in respect of the work and lodge the receipt with the employer.</p>
50	<p>The contractor immediately to remove all offensives matters: All soil filth or other matters of any offensive nature taken out of any trench, sewer, drain, cess-pool or other place shall not be deposited on the surface but shall be at once carted away by the Contractor to place provided by him.</p> <p>The contractor shall keep the foundation and works free from water and shall pro-</p>

	vide and maintain at his own expense's electricity and other power-driven pumps and other plant to the satisfaction of the employer for the purpose until the building is handed over to the employer. The contractor shall arrange for the disposal of the water so accumulated to the satisfaction of the employer and local authority and no claims will be entertained afterwards if he does include in this rate for the purpose.
51	Access: Any authorized representative of the employer shall at all reasonable times have free access to the works and/or to the workforce, factories, or other places where materials are being prepared or constructed for the works and also to any places where materials are being prepared or constructed for the work and also to any place where the materials are lying or from where they are being obtained for inspection, examination and test of the materials and workmanship.
52	Materials, workmanship and samples, testing of materials/final measurement: The contractor shall have to carry out tests on materials and workmanship in approved materials testing laboratories or as prescribed by the employer/architects in approved material testing laboratories or as prescribed by the employer/ architects at his own cost to prove that the materials, etc under test conform to the relevant IS standards as specified in the specifications. The necessary charges for the preparation of mould (in the case of the concrete cube) transporting testing etc shall have to be borne by the contractor. No extra payment on tis account should in any case be entertained.
53	Contractor's employee: the contractor shall employ technically qualified and competent supervisors for the work who shall be available (In turn) throughout the working hours to receive and comply with instructions of the employer/ architects. The contractor shall engage in the execution of the work. The contractor shall employ in connection with the work persons having the appropriate skill or ability to perform their job effectively. The contractor shall employ local labours on the work as far as possible. No labour below the age 18 years and who is not an Indian national shall be employed on the work. The contractor shall comply with the provision of the Payment of Wages act, Employees liability act, Workman compensation act, control labour (regulation and abolition) act-1970 and central rules-1971, and The Apprentice act-1961.
54	Dismissal of workman: The contractor shall on the request of the employer immediately dismiss from works any person employed thereon by him who may in the opinion of the employer be not suitable or incompetent or who may misconduct himself such discharge shall not be basis of any claim for compensation or damages against the employer or any of their offices or employer.
55	Damage to person and property, insurance etc: the contractor shall be responsible for all injury to the work or workmen to persons, animals or things and for all damages to the structural and/or decorative part of the property which may arise from the operations or neglect or himself of a any sub-contractor or of any of his sub-contractor's employees, whether such injury or damages arise from carelessness, accident or any other cause whatsoever in any way connected with the carrying out of this contract. The clause shall be held to include inter-alia any damage to the building work forming the subject of this contract by rain, wind, earthquake, or other inclemency of the weather. The contractor shall indemnify the employer and hold harmless in respect of all and any expenses arising from any such injury or damages to persons or property as aforesaid and any expenses arising out from any injury or damages to

	<p>the person or property as aforesaid and also in respect of any claim made in respect of injury or damage under any acts of compensation or damage consequent upon the such claim.</p> <p>The employer shall be at liberty and is hereby empowered to deduct the amount of any damages, compensations, costs, charges and expenses arising or any from or in respect of any such claims or damages from any sums due to or to become due to the contractor.</p>
56	<p>Payments: All interim payments shall be regarded as advance payments by way of advances against the final payment only and not as payments for work actually done and completed, and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be removed and taken away and reconstructed or re-erected or be considered as an admission of the due performance of the contract or any part of thereof in any respect or the accruing of any claim, nor shall, it conclude determine or affect in any way the power of the employer under these conditions or any other way vary or affect the contract.</p>
57	<p>Final payment: The final bill shall be accompanied by a certificate of completion from the Employer/Architect. The acceptance the final bill by the contractor would indicate that he will have no further claim in respect of the work executed.</p>
58	<p>Variation/ deviation: quantities may be increased or decreased depending on site conditions and employer requirements</p>
59	<p>Substitution: Should the contractor desire to substitute any materials and workmanship, he/they must obtain the approval of the employer/architects in writing for any such substitution well in advance. Material designed in this specification indefinitely by such term as equal or other approved etc specific approval of the employer/architects has been obtained in writing.</p>
60	<p>Preparation of building works for occupation: The whole of the work will be thoroughly inspected by the contractor and the deficiencies and defects put right. On completion of such inspection, the contractor shall inform the employer that he has completed the work and it is ready for inspection.</p>
61	<p>Clearing of the site on completion: On completion of work, the contractor shall clear away and remove from the site all constructional plants and equipment. Surplus materials, rubbish and temporary works of every kind and leave the whole of the site and works clean and in a workman-like condition to the satisfaction of the employer/architects.</p>
62	<p>Concealed work: The contractor shall give due notice to the employer/architect whenever any work is to be buried in the earth concrete or in the bodies of walls or otherwise becoming inaccessible later on, in order that the work may be inspected and correct dimensions taken before such burial, in default whereof the same shall at the opinion of the employer/architect be either opened up for measurement at the contractor's expenses or no payment may be made for such materials.</p>
63	<p>Idle labour: whatever the reasons may be, no claim for idle labour, additional establishment cost of hire and labour charges of tools and plants would be entered under any circumstances.</p>
64	<p>Nomination subcontractor: No subletting of the work is permitted.</p>

65	Notice of any claim: The contractor shall submit within seven days, in case there is any instance for which the contractor considers himself entitled to or likes to prefer claim for additional payment, a statement giving particulars as full and detailed as possible to enable the architect/employer verification, admissibility and assessment failing which no claims will be entertained.
66	Final claims: Not later than 90 days the issue of the completion certificate the contractor shall submit to the architect/employer a statement of final account with supporting documents showing in detail the value of work done in accordance with the contract together with all considers due to him.
67	Certificate of completion: When the whole of the works have been substantially completed and satisfactorily passed any final test that may be prescribed in the contract, the contractor shall give written notice to that effect to the architect /employer with an undertaking to finish any outstanding work during the DLP for issue of a certificate of completion in respect of the works. The architect / employer within 30 days of receipt of such either issue notice to the contractor with a copy to the employer, a certificate e of completion stating the date of completion on which in his opinion the above work substantially completed in terms of the contractor. Or, give instructions to the contractor specifying all the work which require to be done by the contractor before issue of the certificate. The contractor shall receive the certificate after completion of defect rectification work within 30 days of completing work.
68	Bank's right to determine the contract:
69	Opportunities for other agencies: Employer reserves the right to let other contractors in connection with his work under similar general conditions. The contractor shall afford other contractors' reasonable opportunity for the introduction and storage of their materials and execution of their work and shall properly be connected coordinate his work with them.
70	Claims extra: When any instruction or decision given at site involves an extra or where the contractor may plan to claim extra, it shall be the responsibility of the contractor to inform the architect of the extra amount and get written authorization from the architect before proceeding with the work involved.
71	Superintendence supervision: The contractor shall give all personal superintendence during the execution of the work and this obligation and liability will continue until expiration of the maintenance period. The contractor shall also during the whole time of work when in progress employ a competent representative who shall be constantly in attendance at the site while his men are at work. Any directions explanations, instructions or notices given by the Bank or the architect to such representative shall be deemed to have been given and duly served on the contractor.
72	Possession prior to completion: the bank shall have the right to take possession of or use any completed or partially completed part of the work. Such possession or use shall not be an acceptance of any work not completed in accordance with the contract agreement.
73	Action where no specification: In case of any class of work for which there is no such specification in technical specifications, such work shall be carried out in ac-

	cordance with the CPWD specifications and in the event of there being no CPWD specifications, then in such case, the work shall be carried out in all respects in accordance with the instructions and requirements of the Bank/ architect.
74	Technical examination: the project work covered under this tender during its progress is subject to inspection by the CTE / Technical examiner/CVC, Govt of India or by an officer of the Vigilance cell of the Authority, the contractor will be required to extend all assistance or facilities for such inspections.

Signature of tenderer

Date

Address:

List of Mandatory Test

Materials	Test	Frequency
Sand	Silt Content	50 cum and above
	Sieve analysis	Same as above
Aggregate	Particle size distribution	25 cum and above
Bricks	Compressive strength	20000 and above
RCC	Slump	Once a day or as desired for major RCC work
	Cube strength	20cum and above, min 3 cubes to be tested
Cement	Compressive strength	Test certificate to be submitted
Steel	Yield stress, %age elongation	Test certificate to be submitted

Model rules for the protection of health and sanitary arrangement for workers

Contractor has to arrange first aid to workers such as adequate supply of sterilized dressings, sterilized cotton wool. These shall be kept under the charge of responsible person who shall be available during working hours. Covid-19 protocol shall be strictly followed. Some conveyance facility such as car shall be kept readily available to take care of injure person to the nearest hospital.

Contractor shall arrange portable drinking water facility including storage facility so that these can be easily available to workers. Drinking water shall not be located near latrine and bah room.

Adequate washing and bathing facility shall be provided for man and woman separately with proper drainage facility. Similarly, separate urinals, toilets shall be provided for man and woman. A poster showing the figure of man and woman shall be exhibited at the entrance of latrine of respective sex. Latrine and urinals etc., shall be constructed of masonry wall with finishing to keep it neat and clean regularly. The septic tank or crèche shall be constructed for disposal of excreta etc. proper ventilation shall be provided.

Separate ventilated shelter shall be provided for rest of man and woman separately with height of shelter shall be 3m. The temporary shed shall be thatched roof of GI Sheet roof with mud flooring and 50cm above ground level. Crèches shall be provided at work place for children under 6 belonging to such women. Two huts will be provided separately for game and bed room each. It shall be thatched roof, mud floor and walls and planks spread over the mud floor and covered with matching. It shall be sufficiently ventilated. One Dai for each hut shall be provided by contractor and toys and other similar materials shall be provided for children.

A coked food canteen on moderate scale shall be provided for the benefit of workers whenever required.

The contract should quote of item f tender considering above factors accordingly.

ANNEXURE - 1**Format of Guarantee Bond for Anti-termite Treatment (in Rs.100 Non-Judicial Stamp Paper)**

This agreement made this _____ day of _____ two thousand _____ between _____ (name of employer) a body corporate constituted under the _____ name of act/ act 19____ having its head office at _____ (herein called employer) of the one part and _____ (name of Firm/contractor) (hereinafter called "The guarantor) of the project.

WHEREAS THIS AGREEMENT is supplementary to a contract (Hereinafter called the contract dated _____ and made between the Employer of the one part and the Guarantor of the other part) where by the firm from any infestation of termites. And whereas the Guarantors agreed to give guarantee to the effect that the said buildings / structurers shall remain free from any infestation of termites for a minimum of period of ten years (10 years) from the date of completion f pre-construction anti-termite treatment carried out as per the relevant IS Code.

Now the Guarantor hereby agrees to make good all defects and render the buildings/ structurers free from any infestation of termites, during this period of guarantee and to the satisfaction of the employer. Th guarantor also agrees to take up such rectification work at his own cost and within one week from the date of issue of notice from the employer, calling upon him to rectify the defects. The decision of employer as to the cost payable by the guarantor will be final and binding, in case guarantor fails to commence the work as per above notice, and the work got done through another agency or contractor. That if the guarantor fails to execute the pre-construction anti-termite treatment or commits breach there under, then the guarantor will indemnify the principal and the successor against all losses of any default on the part of the guarantor in performance and observance of this agreement. As to the amount of loss and damage and or cost incurred by the employer, the decision of employer will be final and binding.

In witness whereof these presents have been executed by the obligator _____ and by the _____ and for and on behalf of the employer on the day, month and year first above written.

Signed and delivered by _____ (employer) by the hands of Sri _____ in the presence _____

Signed and delivered by _____ (Contractor) in the presence of _____.

ANNEXURE - 2**Proforma of Guarantee Bond for water proofing treatment (Rs 100 Non-Judicial stamp paper)**

**The AGM (LB & RSETI),
SBI, LHO,
Bhubaneswar**

Water proofing treatment to the basement, retaining wall, roofs including stair roofs underground reservoirs, overhead water tanks, sunken floors to the Addition, Alteration & Construction of G+1 Storied Building for RSETI Rayagada, Odisha

We hereby certify that the water proofing treatment to the above places to the construction of multi-storeyed building for SBI, Bhubaneswar described in the schedule of quantities and specifications have been done as per the specification, in accordance with terms and conditions under which he said work has been awarded to us.

1. We hereby guarantee that the basement with retaining wall, roofs, stair roofs, underground reservoir, overhead reservoir and sunken floors of the construction of building for SBI, RSETI shall be in water proof condition for a period of 5 years from the date of handing over of the completed works to SBI.
2. In the event of any treatment necessary subsequently during the period of guarantee of the said basement with retaining wall, roofs, stair roofs, underground and overhead reservoir, sunken floors of the building required inspection and treatment shall be carried out by us at our own cost.
3. The quotation whether further treatment is or has become necessary during the said guarantee period shall be decided by the bank and decision in this regard shall be final and binding.
4. Notwithstanding anything contained hereinbefore, we shall not be held responsible for any leakage caused by alteration, earthquake or other action causing damage the said basement wit retaining wall, roofs, sunken floor stair roof, underground and overhead reservoir of said building.

Witness and address

Signature of contractor with seal

Technical specification of Materials:

1. Materials shall be of approved quality as mentioned in list. Prior approval of materials from architect/employer other than specified is necessary due to non-availability of listed materials. Sample of materials shall be approved by architect/ employer before placing order.
2. Materials shall be tested in govt approved laboratory. Frequency shall be as listed in table. Test certificate of steel, cement, AAC block shall be submitted by contractor for each lot of materials procured for construction. Cos of test shall be borne by contractor including transportation cost and collecting material sample.
3. All equipment and facilities for carrying out field tests on materials shall be provided by the contractor without any extra cost.
4. All works shall be carried out as per specifications given in the SOQ. If there is any discrepancy, architect/ employer will explain the specification. If there is any doubt, CPWD specification shall be followed.
5. Steel scaffolding, centring and shuttering shall be used for RCC work (Slab, beam, column, lintel chajja etc).
6. Surface of Steel reinforcement before placing in position shall be cleaned of loose rust or scaling, dust, grease, and any other objectionable substances as required and directed. Bar bending schedule shall be prepared by contractor as per structural drawing issued and shall be got approved by architect/employer.
7. Binding wire shall be used for securing bars (18-gauge soft annealed steel). No concreting shall be commenced until employer/architect have inspected the reinforcement in position and until their approval have been obtained. A notice of at least 24 hours shall be given to employer / architect by the contractor for inspection of reinforcement. If in the opinion of employer/architect, any materials are not in accordance with specification or the reinforcement is incorrectly spaced, bend or otherwise defective. The contractor shall immediately remove such material from the site and replace with new and rectify any other defects in accordance with the instruction of employer/architect to their satisfaction.
8. Cover to reinforcement shall be as per structural drawing /IS 456.Pre cast cover of ASTRA make shall be used.
9. For brick masonry, plastering and finishing work, bamboo scaffolding shall be used and safety precaution shall be carried out.

Technical specification of materials and workmanship for new tube well with pump set

1. The 200mmx150mm dia tube well is to be sunk to a suitable stratum at a depth of about 105meter below ground level. The depth will be actually determined on examination of the characteristic of the soil and sand particles as well as the extent of the stratum for which accurate data are to be maintained for inspection.
2. The tube well shall have a yield of minimum 32000 ltr of water per hour with a maximum of 3.5 m of depression of water level after 8 hours of continuous pumping. The contractor may make alternative arrangement or suggestions to get the required yield as well as potable water for human consumption.
3. The contractor will be required to supply all materials such as GI/MS pipes, sockets, couplings, companion flanges, caps etc so as to make the tube well complete in all respect. The contractor is also required to supply all tools and plants, drilling rig and pipes and labour for boring and sinking the tube well, withdrawal of the boring pipes, washing and developing the tube well yield

4. The contractor must arrange for all water necessary for boring the tube well. The contractor must comply with the rules and bye-laws of the local authorities for sinking tube well for domestic purpose and obtain necessary sanction as may be required, at his cost.
5. The contractor must keep a scientific record of different strata of soil bored through and retain samples of the strata for examination by the bank, samples of the strata are to be sent to the bank in proper glass container for records.
6. All materials shall be of approved make and quality
7. The contractor shall submit chemical and biological test report by PHE department or government approved laboratory about the sample of water drawn by them from the tube well after development. The water must be for for drinking.

ANNEXURE - 3**FORM 1****PROFORMA OF APPLICATION FOR REGISTRATION OF ESTABLISHMENT EMPLOYING CONTRACT LABOUR**

1	Name and location of the Establishment.	
2	Postal address of the Establishment.	
3	Full name and address of the Principal Employer. (furnish father's name in the case of individuals)	
4	Full name and address of the Manager or the person responsible for the supervision and control of the Establishment.	
5	Nature of work carried on in the Establishment.	
6	Particulars of Contractors and Contract Labour:	
(a)	Names and address of the Contractors	
(b)	Nature of work in which contract labour is employed or is to be employed.	
(c)	Maximum number of contract labour to be employed any day through each Contractor.	
(d)	Estimated date of commencement of each contract work under each Contractor.	
(e)	Estimated date of termination of employment of contract labour under each Contractor.	
7	Particulars of Treasury Receipt enclosed.(Name of the Treasury, Amount and Date)	

I hereby declare that the particulars given above are true to the best of my knowledge and belief.

Principal Employer
Seal and Stamp

ANNEXURE – 4**FORM XII****PROFORMA OF REGISTER OF CONTRACTORS**

1. Name and addresses of the Principal Employer _____
2. Name and address of the Establishment _____

Sr. No	Name address and of contractor	Nature of work on contract	Location of contract work	Period of contract from to	Maximum number of workmen employed by the contractor

ANNEXURE – 5

PROFORMA OF SITE ORDER BOOK

Name of the work _____

Date of Commencement _____

Sr. No	Remarks/ Instructions of the site Engineer/ Architect	Dated Initials of site Engineer/ Architect	Initials of the Contractor for having received the instructions	Action taken with date	Dated initials of the site Engineer	Remarks of the Architects PMC/ C.C. Officials
1	2	3	4	5	6	7

ANNEXURE - 6**PROFORMA FOR APPLICATION BY CONTRACTOR FOR EXTENSION OF TIME**

1.	Name of the Contractor			
2.	Name of the work as given in the Agreement			
3.	Agreement WO			
4.	Tender amount			
5.	Date of commencement of work			
6.	Period allowed for completion as per agreement			
7.	Date of completion as per agreement			
8.	Period for which extension of time has been given			
		<u>Date</u>	<u>Month</u>	<u>Year</u>
	a)	1 st extension vide Bank's Letter No.		
	b)	2 nd extension vide Bank's Letter No.		
	c)	3 rd extension vide Bank's Letter No.		
9.	Reasons for which extensions have been previously given (copies of the previous applications should be attached)			
10.	Period for which extension is applied for and the reasons thereof including hindrances, time for extra work assigned, if any etc.			

Signature of Contractor

Recommendations of Architects

Signature of Architect.

ANNEXURE – 8**CONTRACT EXECUTION****EXTENSION OF TIME PERIOD FOR THE WORK OF**

1.	Name of work & E.C. sanction	
2.	Name of Contractor	
3.	Contract Cost	
4.	Date & Reference of work order	
5.	Date of start of work(As per work order)	
6.	Time period as per tender	
7.	Scheduled Date of completion	
7.A	Interim schedule if any	
8.	No. of extensions	
9.	Date & Reference of last extension	
10.	Reasons for delay and period of delay for each reason including corrective action taken by Bank/Architect (quote & attach references wherever necessary) i) ii)etc	
11.	Total delay due to abovedays
12.	Responsibility for each reason for delay (a) Bank (b) Architect (c) Contractor (d) unforeseen circumstance (e) force measures etc. and corrective action not been taken (Attach references of letters etc.)	
13.	Present status of work – Physical progress, % progress & cost of work remaining/ incomplete	
14.	Any interim schedule / milestone achieved	
15.	Any other hold/restraint envisaged in the completion of the remaining work. suggest corrective actions necessary	
16.	Recommendation for the no. of days of extension along with reasons	
17.	Financial loss to the Bank if any due to this extension and recommendations for liquidated damages if justifiable (State reasons)	

Engineer-in-charge

Recommendation approved

Proforma for cement and steel consumption statement, running bill, final bill, deviation statement and other relevant proforma shall be collected from consultant or bank.

Quantities of theoretical consumption of cement for major items of work shall be as per CPWD norms wherever applicable.

Note: - Item of work site Engineer shall refer to the C.P.W.D. Specifications and norms. In case of coefficient is available for a specific item, the decision of SBI/Architect shall be final and binding on the contractor.

ANNEXURE – 9

LETTER FOR GRANTING EXTENSION OF TIME

To

Dear Sirs,

**Bank's Office Building / Staff / Officer's Quarters under
Construction at _____ work- Extension of Time**

Refer your letter No. _____ dated _____ in connection with the grant of extension of time for completion of the captioned work.

The date of completion of the above-mentioned work is _____ as stipulated in the contract. Extension of time for completion of the work upto _____ is, hereby granted by the Bank without prejudice to the right of the Bank to recover liquidated damages in accordance with the provisions of the contract.

Notwithstanding the extension hereby granted, time is and shall continue to be the essence of the said contract.

Yours Faithfully,

Architects

ANNEXURE – 10

SPECIMEN OF LETTER GIVEN TO THE CONTRACTOR IN REGARD TO THE RECTIFICATION OF DEFECTIVE WORK AND REMOVAL OF SUBSTANDARD MATERIAL

To

M/s. _____

Sir,

SUB: NATURE OF WORK

I, whereas the above work has been awarded to you under the subject contract and the same is in progress/the same has been completed.

2. Whereas the items of works as detailed in schedule attached herewith have been executed with unsound, imperfect and unskillful workmanship/with materials of inferior description and that materials and/on articles provided for the execution of the work are unsound and of a quality inferior to the contracted for.

3. Whereas the materials and/or articles provided by you for execution of the work as detailed in the schedule hereto are unsound and of quality inferior to that contracted for.

4. Now you are hereby called upon to rectify or remove and reconstruct forthwith each item of work as detailed in the said schedule of work in whole or in part as the case may require with sound, perfect and skilful workmanship and/or with materials and articles of sound and proper quality as per the contract at your own cost and charge.

5. I, in exercise of the powers conferred on me by the aforesaid agreement, hereby give you notice to remove the cause set out above within.....
....days to my satisfaction falling which action will be taken against you under clause (8).....of the agreement. Yours faithfully,

Asst. General Manager (LB & RSETI)/ Dy. General Manager (FI)

ANNEXURE – 11

CERTIFICATE

The measurements on the basis of which the above entries for the bill No. _____ were made have been taken jointly on (date) _____ and are recorded at pages _____ to _____ of measurement /sheet book No. _____.

Dated

Signature of Contractor

The work recorded in the above-mentioned measurements has been verified at the site satisfactorily as per tender drawings, conditions and specifications.

Signature of Project Engineer of Architect

Designation:

Dated:

Volume – I

TECHNICAL SPECIFICATIONS FOR CIVIL & ALLIED WORKS

TECHNICAL SPECIFICATION FOR CIVIL WORK

1.1. General:

Scope of Work: The work contemplated under this contract includes General Builder's work for the aforesaid project, all as detailed in the Bill of Quantities, Specifications and to complete the said work in every respect in accordance with this contractor and with the directions and to the satisfaction of the Architect/ Consultant/ Owner/Employer.

Indian Standard Specification:

The particular Specifications for the work is as detailed hereinafter. These specifications shall be read in conjunction with the relevant Indian Standard Specifications and the obtainable as per local practice as detailed in various regional handbooks of practice and the work shall be executed accordingly. Where the specifications in any of the standards are at variance with the specifications detailed herein, the specifications herein shall govern.

Quality of Materials & General Standards of Work:

The contractor under this contract commits himself to use first class materials and assumes full responsibility for the quality of all material incorporated or brought for incorporation in the work. The work shall be executed in accordance with best engineering practice and as per direction of Architect/Consultant/Owner/ Employer.

Scaffolding:

All scaffolding and ladders required for the proper execution of the work shall be provided by the Contractor. The scaffolding should be stout and strong to prevent any collapse or displacement. Proper measure for safety of workmen working on scaffolding should be taken by the contractor.

Measurements: The mode of measurements, wherever possible is specifically mentioned in these documents, where it has not been mentioned, it shall be as per provision of the relevant Indian Standards. All the measuring tapes and other accessories necessary shall be provided by the contractor.

Tools and Plant: The contractor shall make all tools, plants and machinery necessary for execution of the works. He shall also arrange additional tools, plants and machinery as felt necessary by the Architect/Consultant time to time with no extra cost to owner. It is obligatory on the part of the contractor to arrange tools, plants & machinery at the work site in good and sound conditions, failing of which may constitute a breach of contract under the sole description of Architect/Consultant/Owner/ Employer.

Surveying and Staking: It is the express responsibility of the contractor to bring to site all surveying instruments necessary for the marking out, fixation of levels, etc. and conduct these survey operations himself with utmost accuracy. The contractor shall put up stable bench marks etc. as necessary for the work. Architect/Consultant/ Owner/ Employer/his representative will be present when this work is being carried out and will inspect all these operations with the Contractor's assistance. The contractor shall be entirely responsible for accurate setting out of the work and he shall at his own expense make good any defects arising from errors in line and levels.

Dewatering: Dewatering of accumulated water in all locations on job site from whatever source or cause until the virtual completion of the entire work shall be done by the contractor at his own expense and shall not be separately paid for. The rates quoted by the contractor shall be deemed to be inclusive of this.

Access to site, approach roads and roads within the premises:

The contractor shall at his own cost provide all approach roads required for the purpose of carrying out the work in the most expeditious and efficient manner and shall remove the temporary roads on completion. He shall acquaint himself thoroughly regarding condition and suitability of public roads leading up to the limits of the premises and will provide vehicles for transportation of materials which meet the requirements of these road conditions. It shall also be responsibility of the contractor to maintain at his own cost these roads till the construction is completed. The tenderer also acquainted himself with local laws and bylaws and complying with all police and highway authority requirements.

1.2 Earth Work:

Excavation:

Excavation for trenches over areas and for pits, etc. shall be done to widths, lines and levels as shown in drawings or to such lesser or greater widths lines and levels as directed. The bottom and side of excavation shall be trimmed to required side of excavation shall be trimmed to required levels, profile, etc. watered and thoroughly rammed. Where the contractor excavated below required level in good round inadvertently or carelessness, they shall make up the void in concrete (1:5:10) at his own expense. During excavation the contractor shall take necessary precaution to retain earth, so that the earth will not slide or fall down to avoid any accident and hamper the progress of work. They will take necessary step to prevent the damage the adjacent structure or existing services. They shall repair and make good any such damage at their own expense to the satisfaction of the owner. A suitable path for men and materials around the excavated pit should be maintained throughout the work.

Dewatering: All water which may get accumulated in excavations during the progress of work from whatever cause or source, shall bailed or pumped out as necessary. The rates for excavation shall be deemed to include for the same, if not otherwise specified.

Timbering to excavation (shoring): Where the soil is soft and sides of excavation needs supporting suitably designed planking and strutting shall be provided. The rates for excavation shall be deemed to include for all planking and strutting as necessary.

Refilling around foundations: Refilling around foundations shall be done with approved excavated materials. Refilling shall be done in layers not exceeding 30 cm thick, watered adequately and consolidated. The finished surface of filling shall be slightly proud to bring it to finished level after watering and consolidation as directed. The rates for refilling around foundations shall be deemed to include for this.

Disposal of Surplus excavated Materials: All materials considered surplus shall be removed to destinations and disposed off as directed. The disposal of the materials can be in any of the following ways as directed by the Architect/Consultant/Owner/Employer.

1. Filling in low lying areas
2. Filling in at places of filling such as under floors, in roads, etc.
3. Stacking of materials in pre-designated stacking yard.
4. Removal of material outside the plot for disposal.

Filling: Filling under floors or other places indicated shall be done with approved material obtained from excavation or approved materials brought from outside by the Contractor. The material should generally be of good quality. Filling shall be done in layers not exceeding 30 cm. thick and each layer shall be watered adequately and consolidated properly by 8 to 10 tones power rollers in the case of where floor is coming or pneumatic rammers where ever conditions permit. If it is not possible, the consolidation shall be done by hand rollers and pneumatic/hand rammers. The surface of the filling shall be finished to lines and levels as required. The filling shall be compacted in such a manner as to guarantee full stability. The compaction shall be such that minimum relative density obtained on testing is 90%. In general, test shall be performed for every 1000sqm of compacted area. The filling final level after consolidation/then cutting and ready to take up soling work under the floor item, shall be checked by Architect/Consultant/ Owner/Employer.

Measurement: Measurement for all excavation, filling, carting away and earth work shall be in solid measure. The rates quoted by the tenderers are thus for solid measure units. The following factors shall be applied to obtained quantities of solid measure.

Excavation	:	No reduction in volume
Filling watered and	:	Volume shall be determined by levels consolidated in layers levels taken before and after compacted filling and by measuring the length and breadth as required.
Loose measure (as in trucks):	:	Volume of loose measure less or dumping's 25% or as per I.S. code of practice.

The mode of measurement for various type of excavations shall be as under:

- a) In case of trenches, pits and areas, measurements shall be on the basis of width of foundation & the depth of bottom of foundation (bottom of bed concrete if provided) formation. Surface dressing shall be measured in plan projection only.
- b) In case of pipe trenches and drains, measurement of width of trench shall be diameter of the pipe plus an allowance of 50 cm. to allow for collars, flanges etc.
- c) Excavation in rock shall be measured up to levels indicated or required. No undulations as physically appearing after excavation shall be taken into consideration while arriving at the quantities. The rates quoted by the contractor shall be deemed to include for this and no extra is admissible.

Sub-grade Conditions: When no data is available of soil formation and depth of water level of propose works site the contractor should make his own arrangements of preliminary site investigation by actual inspection of the site and surrounding areas to assess the nature of soil and to foresee the difficulties that may arise during construction period. The contractor shall acquaint himself of the above before filling up of the tender.

No claim whatsoever will be entertained on any account of conducting these exploratory works or lack of investigation on the part of the Contractor.

Brick Soling: Where brick soling is required to be provided, it shall confirm to the following specifications:

It shall either be flat or be laid on edge of the bricks touching each other as per item. Soling where specified in two layers, the line of joints in the bottom layer shall cross those in the top layer. Soling shall be closely packed leaving no interstices or gaps. The interstices to be filled with fine sand and shall be sprayed with water. If cavities appeared between two bricks after spraying with water it shall be mended again by spreading fine sand. Where ever floor concrete is coming on soling, building paper (polythene sheets) is to be laid to receive the concrete.

Controlled Concrete, Plain & Reinforced Concrete:

General: Concrete and reinforced concrete work shall be carried out generally in conformity with the latest Indian Standards IS:456 except for provisions indicated here in below. All work is to be carried out with utmost precision and up to-date scientific know-how and the contractor shall employ thoroughly competent staff to achieve the highest standards.

Cement: Cement for the work shall be ordinary PPC conforming to the latest Indian Standards and of the best normal setting quality unless a quick setting quality is expressly instructed in the specifications or otherwise during the course of the work by Architect/Consultant/ Owner/ Employer. If directed the contractor shall purchase PPC cement as fresh as possible after manufacture and where there is reason to believe the cement has been long stored, Architect / Consultant / Owner / Employer may demand a Laboratory Test Certificate regarding the character of cement and the contractor shall furnish the same at no extra cost. Architect/Consultant/ Owner/Employer shall reject any cement which in its opinion does not meet the required standards contractor shall consider in his rates during quotation that cement supplied by Client, has to be tested either from engineering College or any professional laboratory to have a judgment on Quality of Cement.

All bags and containers in which cement is packed shall be stored in a dry, weather-tight, properly ventilated structure with adequate provision for prevention and absorption of moisture. The contractor shall at all times maintain for the inspection of Architect/Consultant/Owner/Employer a log book indicating the receipt of cement, brand and agent from whom obtained and the age of cement. Cement which has caked or perished by being wet or otherwise, shall on no account be used on the work.

Cement shall be consumed on the works in the same sequence as that of their receipt at site. Cement reclaimed from cleaning of bags or from spillage from containers or otherwise shall on no account be used.

Sand: Fine aggregate shall generally conform to latest Indian Standards (IS:383). Sand shall be natural sand, crushed gravel sand or crushed stone sand at the discretion of the Contractor. Use of sea sand is prohibited. It shall be composed of hard siliceous material and shall be clean and of sharp angular grit type. Sand shall be properly graded minimizing all voids.

Allowance for bulking of sand shall be made. Silt content on sand should not be more than 5% Laboratory equipment such as measuring jars etc. are to be kept at site for time to time checking of bulkage and silt content.

Coarse Aggregate: Coarse aggregate shall be approved hard aggregate generally conforming to latest Indian Standards.

Aggregate, Gradation, Storage, etc.: Aggregates shall be stock piled properly and separately on the basis of gradation indicated herein below.

Fine	:	0 to 3 mm (1/8" and down)
Medium	:	3 to 7mm (1/8" to 5/16")
Coarse	:	7 to 30 mm (5/16" to 1.1/4")

Aggregates shall be clean and shall not contain any foreign matter, silt, loose or destructive substances, harmful chemicals, etc.

Aggregates shall be stored in proper bins which shall have good drainage to prevent the inclusion of foreign matter and preserve the gradation. Sufficient live storage shall be maintained to permit segregation of successive shipment, placing of concrete at the required rate and such procedures as inspection and testing.

If directed, the aggregates shall be washed before use. The grading of aggregates for use on works shall be as per the Indian Standards.

Proper sieve analysis shall be carried out to determine the best gradation obtainable from the available aggregates. The sieve analysis shall be performed as per standard practice and as laid out in the relevant Indian Standards.

A complete set of standard sieve shall be provided by the Contractor at the Construction site at all times. The graphs in connection with the sieve analysis and the standards of approvals for the aggregates shall be as per Indian Standards.

Water: Water for all concrete work shall be clean, free from deleterious matter such as oils, acids, alkalies, sugar and vegetable matter. Every attempt shall be made to use water which is fit for drinking purposes. Water storage facilities provided by the contractor shall be maintained properly to preclude contamination of water by any of the harmful substances. The quantity of water to be added to concrete for mixing shall be such as to afford workability consistent with strength. Water/cement ratio shall be recorded in every batch of concrete.

Arrangement for slump cone test shall be kept at site to arrive workability whenever the Architect/Consultant/Owner/Employer wants to check at site.

Tests for determination of strength of concrete: As will be apparent from the Bill of Quantities, the strength of concrete specified is the criterion and the contractor shall make every effort to obtain the specified strengths by good quality control. In case of concrete which does not obtain the specified strength at 28 days. Such work shall be demolished and reconstructed to obtain the requisite strengths all as directed by Architect / Consultant / Owner / Employer. To determine whether concrete in any particular part of the work is of the requisite strength or not, test cubes (works test cubes) shall be made from samples collected from the concrete being poured for the particular part and determined as per acceptance cri-

teria detailed hereinafter. The salient features for the collection of samples is as indicated below.

Testing of Concrete Cubes for determining Compression Strength:

1. Quality As specified
2. Compression strength shall be as specified for the particular type of concrete.
3. Criteria for acceptance of work.

Part or element of concrete work shall be deemed to be acceptable, provided the three cubes tested for 28 days strength conform to the following:

- a) Average of the three cubes strengths shall not be less than the specified strength.
- b) No individual cube strength shall be less than 90% of the specified strength.
- c) If any individual cube strength exhibits more than 133% of the specified strength, such cube shall be classified as freak and criteria in (a) and (b) above, shall be applied for the remaining two cubes only and the acceptability determined.

4. Quantum of cubes and testing

A set of 6 cubes shall be cast per every 50 M3 of concrete. OR A set of cubes on every day of concreting. OR A set of 6 cubes on every important element as decided by Architect / Consultant / Owner / Employer of the work. The decision of Architect/Consultant/Owner/Employer in this regard shall be final and binding.

Batching and making of concrete: All batching of aggregates and cement shall be by volumes. All the necessary equipment such as measuring boxes, devices for determination of moisture and bulk in sand, slump cone etc. shall be provided by the contractor. Concrete shall be machine mixed until there is a uniform distribution of materials and uniform color and consistence is achieved and under no circumstances for less than two minutes.

A wooden board approximately 30 CMS. x 40 CMS. shall be put up at the concrete mixer on which shall have been legibly written English and the social language, the quality of concrete that is being mixed, the proportions and other relevant data.

Slump: If in the opinion of Consultant, slump cone tests are required to be performed to establish workability the same shall be carried out free of cost. Slump tests are however, to serve as guide only.

Form Work: Generally, all the concrete surfaces are intended to be plastered. Form work shall be properly designed and constructed such that it is rigid enough to remain free from bulging, sagging or replacement during placing of concrete. It should also be so constructed as to facilitate removal of the same without damage to concrete. The form work shall be adequately watertight to prevent any loss of liquid. All form work shall be accurately erected in regard to size, levels etc. In case of timber form work, the surface of forms in contact with concrete surfaces shall be wrought. The joints between boards shall be close fitting and very thin for the concrete surfaces designed to have exposed finish and not intended to be plastered. All form work shall be properly cleaned before any concreting is carried out.

Surface of forms coming in contact with concrete shall be treated with approved form emulsions. It shall be ensured that these emulsions do not stain or discolor the natural color of concrete.

All form work shall be removed as per latest IS:456. Form work shall be removed without shock or vibration. Edges of beams and columns if required to have chamfers shall be obtained by suitably fixing triangular edge beads 20 mm x 20 mm. to the forms. (No extra is admissible to the contractor on account of these incidental and minor works for sizes up to and including 20 mm x 20 mm). Likewise, where drip notches are necessary, they should be formed by suitably shaped fillets nailed in forms.

Form work for all beams and other horizontal construction members shall be built to an upward camber of 1/300" of the span (in the center) to nullify the effects of optical illusion. The Camber shall be in addition to such camber as may be required and shown in the Static Calculations.

Transporting and Pouring of Concrete: No mixing of concrete shall be started unless the situation where they are to be poured are prepared and kept ready. Concrete shall be poured immediately on preparation. Transporting of concrete shall be done as speedily as possible and also in a manner to prevent segregation of aggregates. No retempered concrete shall be allowed to be used on the works. No concrete shall be allowed fall through a height more than 1.20 M. where the concrete to be placed from more height it should be done through chute as directed by Architect/ Consultant/Owner/Employer.

Lift of concreting shall normally be not greater than 2.00 M in height.

Before fresh concrete is placed against an already cast and hardened section, such surfaces shall be roughened, swept clean, moistened with water and treated with cement slurry. Fresh concrete shall than be poured as required. Under no circumstances, concrete mixed more than 20 minutes shall be used where initial setting has commenced. Dewatering of excavations for concreting where necessary shall be carried out by the contractor as directed and the rates quoted by the contractor are deemed to be inclusive of such dewatering. No concreting shall be done in adverse weather condition without proper precautions or approval from consultant. Where materials are to be mixed by hand mixing as per requirement it is desirable to use 10% more cement that that of machine mixing.

Consolidation and Processing of Concrete:

Concrete for all works shall be compacted by means of suitable vibrating equipment. One or more spare vibrators which are in complete working condition shall always be kept ready at sites to be put into commission in case of failure of the vibrators under use. The vibrators shall be operated by skilled personnel, thoroughly instructed as regards the mode, frequency, duration etc. regarding vibration. Concrete of low quality may however be permitted by Architect/Consultant/Owner/Employer to be consolidated by hand only after prior permission.

Finish to Concrete Surfaces:

Finish to concrete surfaces at various situations shall be as per directions of Architect/Consultant/Owner/Employer. Where form finish is specified, the final surface shall be smooth and even and no-undulations, ridges, spots etc. shall be permitted. They shall be laid to pattern as directed. In case surfaces intended and directed for form finish, exhibit any of the defects above mentioned, the surfaces shall be rubbed with carborundum or plastered and finished as directed at the risk and cost of the contractor. The decision as to the acceptability or otherwise of a surface will be notified by Consultant and the contractor will implement the instructions accordingly.

Concrete cover for reinforcement:

Concrete cover for the reinforcement shall be as per the latest Indian Standards and as per directions at site from time to time proper concrete cover blocks to suit various covers as required shall be provided in adequate numbers sufficiently ahead of the work.

Construction joints:

Construction joints in concrete work shall be provided as far as possible only at predetermined places in consultation with Architect/Consultant/ Owner/ Employer. Joints shall be provided as specified in latest Indian Standards or as directed by Consultant.

Curing:

It is very important that all cement concrete work shall be cured properly. All concrete work shall be kept continuously in a damp or wet condition by pouring or by covering with a layer of moist sack, canvas, hessian or similar material for a period of seven days at least from the date of concreting. Water used for curing shall also be free from any deleterious substances and shall generally be fit for drinking. The work shall be adequately protected from drying, winds and direct sun rays. The contractor should arrange at his own cost a temporary water supply line with provision of centrifugal pump valves etc. for curing and constructional purpose at higher level. A sample sketch is enclosed for the reference purpose.

Stop cooks with spray nozzles with an interval of 12m are to be put in ring main.

Opening and inserts:

All opening and inserts which are designated in due time or as required for services, will be exactly provided by the contractor including supply of materials. The contractor should also fix the anchors or such items which may be supplied by the proprietor in exact position and in perfect lines and levels. Inserts apply to such items as timber, dowels, bolts, loop, brackets, suspension irons, hooks, screws, plates, pipe of various types and diameter etc. Openings in concrete or masonry must be provided in exact location to correct shape, size and depth or slightly bigger, if directed so, as shown in drawings or as instructed. It must be clearly understood that the provisions of inserts and openings as contemplated in this contract are to be carried out with "utmost precision" and any deviation of the same from that as shown in drawing or instructed have to be rectified by the contractor at his own cost and responsibility. The contractor should make provision of openings to deep beams and their members at bottom or at lower level as necessary for cleaning purpose prior to concreting.

Ready Mixed Concrete (RMC)(IS: 4926-2003)

Concrete Mix Information to be supplied by the purchase:

RMC: _____

Contractor: _____

Site: _____

MIX CODE	
Grade (N/ sqmm) (Characteristic strength)	
Minimum Cement content (Kg/ cum)	
Mineral additives (Pulverized fuel ash/slag others (Kg per cum)	
Maximum free water cement ratio	
Nominal maximum size of aggregate	
Cement type and grade	
Target workability (slump in mm)	
Target workability at site	
Maximum temperature of concrete at the time	

of placing	
Class of sulphate resistance (if applicable)	0
Exposure condition if applicable	
Class of finish if applicable	
Mix application	
Method of placing	
Any other requirement	
Concrete testing	
Material testing (any none routine requirement)	
Alternatives to be offered (yes.NO)	
Method of curing to be used by contractor	
Quantity	

DELIVERY TICKET INFORMATION:

The following information shall be included in the delivery ticket to accompany the load to the purchaser:

- a. Name or number of the ready mixed concrete depot
 - b. serial number of the ticket
 - c. date:
 - d. Truck number
 - e. Name of purchaser:
 - f. Name and location of site,
 - g. Grade or mix description of the concrete
 - h. Minimum cement content (if specified)
 - i. specified target workability,
 - j. Minimum cement content,
 - k. type of cement and grade
 - l. maximum free water -cement ratio
 - m. nominal maximum size of aggregate,
 - p. General type or name of any chemical and mineral admixtures included
 - q. quantity of concrete in cum
 - r. time of loading,
 - s. signature of plant operator,
- a statement warning the purchaser of the precautions needed to be taken when working with cement and wet concrete

Following information on site shall be added;

- a. Time of arrival, on-site,
- b. Time when discharge was completed,
- c. Any water/admixtures added by the supplier to meet the specified workability,
- d. Any extra water/admixture added at the request of the purchaser of the concrete or his representative, and his signature,
- e. Pouring location.
- f. Signature of the purchaser or his representative conforming discharge of the load.

Tor Steel Reinforcement: FE 500D and above (SAIL/TATA/JINDAL/VIZAG STEEL)

All M.S. reinforcement for concrete work shall conform strictly to the latest Indian Standards (IS:432 - part I & II). They shall be of tested quality with a permissible stress value of 1400 Kg. Sqcm. High yield strength Ribbed Tor steel of cold twisted steel for reinforcement shall be of tested quality and shall conform to the relevant Indian Standards (IS:1786). Reinforcement shall be fabricated to shapes and dimensions shown on the drawing and shall be

placed where indicated on the drawings or required to carry out the intent of drawing and specifications or as directed by Architect/Consultant/Owner/Employer. Before placing, reinforcement shall be thoroughly cleaned of loose rust, coating etc. which would result in reducing or destroying the bend. Oiling the bars to clean them is strictly prohibited. Bending, straightening, cutting etc. operations shall be carried out in a manner not injurious to the material.

All reinforcement shall be bent cold. Unless otherwise directed, reinforcement shall not be spliced at points of maximum stresses. Architect/Consultant/ Owner/Employer shall be informed of the same before such splicing is taken up. Laps and splicing shall conform to the latest Indian Standards.

Reinforcement shall be accurately tied at all intersections and laps with 16 SWG soft drawn binding wire, such that the reinforcement will give a rigid structure. Binding wire will not be measured or accounted for separately. The contractor's rate for reinforcement will be measured and paid for according to bending lists without allowances for cutting, wastage, binding wire etc. Authorized laps, hooks, chairs, spacers etc. shall however be accounted for in case, the contractor or Architect/Consultant/Owner/Employer desires to resort to welding or swivel nuts, there shall however be made as if the laps have been provided and no extra claim whatsoever shall be admissible on this account.

Reinforcement shall be assembled in place with proper concrete cover blocks to suit various covers as required.

Measurements:

All measurements shall be as given below or where not given as per latest IS : 1200 Concrete will be compensated for according to its actual volume.

The computation will be based upon the construction plans only and no site measurements shall be taken for this purpose. All incidental work stated in the Technical Specifications and also dewatering at the time of concreting are deemed to have been included for in the unit prices quoted by the contractor. Openings with an area larger than 0.1 sqm. shall be deducted from concrete quantity and where openings are smaller, these shall not be deducted.

Form work will be measured and paid for according to their contact area. The unit prices of the forms incorporate all scaffolds, nails, clamps and all incidental work. Openings with an area larger than 2 M2 shall be deducted from form work quantities and the form work required for sides of such openings shall be paid for. Openings of less than 1 Sqm. area shall not be deducted from form work quantities and no allowance for form work for sides of such openings shall be made.

Reinforcement steel will be compensated for according to the approved bending lists without allowances for cutting, rolling margin and waste. Binding wire, cover blocks etc. will not be measured or paid for separately. The contractor shall prepare the **Bar Bending Schedules** and incorporate the same on the reinforcement drawings all as directed and submit it to Architect/Consultant/ Employer for approval.

All openings and inserts which are indicated in drawings and as per requirements for services shall be provided at exact positions and no payments shall be made for providing or fixing these. Only such openings or inserts which have not been indicated earlier or such additional openings/inserts required especially due to changes made by Architect/Consultant/Owner/Employer shall be paid for.

Excepting for the above, all other measurements shall be as per stipulations under the latest Indian Standards Mode of Measurements for Building Works.

1.4 MASONRY:

Materials:

All bricks shall be fly ash bricks of locally available good quality quality. They shall be hard sound and well burnt with sharp edges and of uniform sizes and shapes. Bricks shall be neither under burnt nor over burnt and shall be free from cracks, stone floats, or other such defects.

When immersed in water for 24 hours, bricks shall not absorb more water than 20% of its dry weight. All bricks shall be identical/ equal to samples submitted and approved by Company before the commencement of the work. Crushing strength of bricks shall not be less than 35 Kg. Sq.cm. Metallic sound of brick is also a criterion for quality.

Cement and Sand:

Cement and sand used for masonry and plastering work shall confirm to the specifications laid down "Plain and Reinforced Concrete".

Additives:

Additives, like integral water proofing compounds, shall be of the approved type from reputed manufactures. These shall be used strictly in accordance with the manufacturer's instructions/specifications. The additives shall conform to IS: 9103.

Samples:

When demanded by Architect/Consultant/Owner/Employer, the Contractor shall produce samples of materials or carry out samples of work for Company's approval. All materials used as also works carried out shall conform, to the quality of approved samples. Production of these samples shall be at Contractor's cost.

Brick masonry:

Brick shall be soaked in clear water for at least six hours in a vat before use. The average water absorption of brick after immersion in water shall not be more than 20% by weight. Bricks shall be laid in English bond unless specified otherwise. No half or quarter brick shall be used except as closures. Brick shall be accurately raised to plumb.

Brick work shall be raised uniform all round and no part shall be raised more than 1 meter above another at any time, and the work shall be properly toothed and racked back.

In case of 11.5 cm. thick brick walls, hoop iron reinforcement 25mm x 12 to 16 gauge or wire netting reinforcement shall be provided in every fourth course. The reinforcement shall be properly bedded in mortar, properly lagged etc. all as directed.

The contractor will have to build in holdfast and such other fittings in brick work without extra cost.

Joints in brick work shall not be more than 10mm thick. Brick work shall not be raised more than 10 to 12 courses a day. The work shall be kept watered thrice a day for 10 days and afterwards twice a day for 3 weeks. All joints shall be thoroughly flushed with mortar at every course. Care shall be taken to see that bricks are properly bedded and all vertical joints completely filled to the full depth. The jointed of brick work shall be raised out to a depth not

less than 10mm. as the work proceeds. The surface of brick work shall be cleaned down and watered properly before the mortar sets.

Construction joints are to be provided at an interval of 30 m in the case of boundary wall or where the length of brick wall is long.

The contractor shall also make or leave holes recesses as required and fill in the same at a later date as directed at no extra cost.

Measurements:

1. General

All the rates quoted by the Contractor shall be for a fully finished item of work and shall include for all material, labour, miscellaneous works like storage, loading/unloading, scaffolding, hoisting gear etc. as also all taxes, duties, overhead, profits, etc.

2. Masonry

Accounts on masonry shall be settled on the basis of cubic meters or square meters as indicated in the Bill of Quantities. Quantities will be decided on the basis of pertinent plans. Openings and recesses which exceed 0.10 cum. will be deducted from quantities. Openings left initially on specific instructions or as required shall be closed at a later date, if so, instructed by Consultant, at no extra cost. Similarly, all openings, recesses, grooves etc. shall be provided at no extra cost. All materials supplied by Clients shall be fixed in masonry free of charge.

Lintels above door/window openings, for openings up to 100 cm. clear width shall be treated as part of masonry and the cost therefor shall be settled in the same manner as for masonry, irrespective of what material these lintels are made of. For openings of larger than 100cm. clear width, however, lintels shall be paid for under relevant items and due deduction shall be made in masonry.

1.5 Damp proof Course (D.P.C.):

Damp proof course shall be provided over all walls as directed. Concrete for damp proof course shall be of M-20 grade, as defined under "Concrete" section and shall be 5 cm. thick or as specified in bill of quantities and to the full width of the wall. An integral waterproofing compound shall be provided in the concrete in the proportion specified by manufacturer. The rate quoted for D.P.C. shall be inclusive of the integral waterproofing compound as also for shuttering required. The waterproofing cement additive shall comply IS:2645.

1.6 Wood Work and Joinery:

Timber:

Unless otherwise specified all timber for frames for doors, windows & ventilators should be best quality sal wood, the timber should be free from knots, shakes, fissure, flaws, sub cracks & other defects. The surface shall be smooth & free from blemishes & discolorations.

All timber for carpentry and joinery in touch with masonry of concrete shall be wood preservative before fixing.

All fully fabricated timber shall be air seasoned on site of work for a period of not less than two months to allow for any shrinkage that may take place. The preparation of timber for joinery is to commence simultaneously with the beginning of the project work generally and should proceed continuously until all the wood work is prepared and fixed/stacked on or near the site as the case may be.

Workmanship and Construction:

The workmanship shall be first class and to the approval of Architect/ Consultant/ Owner/ Employer. Scantlings and boarding's shall be accurately sawn and shall be of required width and thickness. All carpenters work shall be wrought except where otherwise described. The workmanship and joinery shall be accurately set out in strict accordance with the drawings and shall be framed together and securely fixed in approved manner and with properly made joints. All work is to be properly tenoned, shouldered, wedged, pinned, braded, etc. and properly glued with approved quality adhesive to the satisfaction of Architect / Consultant / Owner / Employer. Door / Window frames shall have cut rebates. Planted rebates shall not be permitted where door frames are fixed flush with plaster to wall, wooden cover mold of 40 x 12 mm to be provided.

Doors, Windows Frames:

The specifications for frames of doors, windows, ventilators and clearstory windows are described here. The frames shall be wrought, framed and fixed in position as per detailed drawing and as directed by Architect/Consultant/ Owner/ Employer. Specified timber shall be used, and it shall be sawn in the direction of the grains. Sawing shall be truly straight and square. The scantling, shall be planed smooth and accurate to the full dimensions, rebates, rounding's, and moldings as shown in the drawings made, before assembling. Patching or plugging of any kind shall not be permitted except as provided. A tolerance of 2/3mm shall be allowed in the finished cross section dimensions of door and windows frames.

Joints:

These shall be of mortice and tenon type, simple, neat and strong Mortice and tenon joints shall fit in fully and accurately without wedging or filling. The joints shall be glued, framed, put together and pinned with hardwood or bamboo pins not less than 10mm dia, after the frames are put together in position by means of a press.

Gluing of Joints:

The contact surface of tenon and mortice joints shall be treated before putting together with synthetic resin adhesive of make approved by Architect / Consultant / Owner / Employer.

Fixing in Position:

Before the frames are fixed in position these shall be inspected and pressed by Architect/Consultant/Owner/Employer, the frame shall be placed in proper position and secured to walls or columns as the case may be with metallic fastener, iron hold fasts as per direction by Architect / Consultant / Owner / Employer.

In case of door frames without sills, the vertical members shall be embedded in the flooring to its full depth when sills are provided, these sills shall be embedded sunk in the floor to its full depth. The door frames without sills while being placed in position, shall be suitably strutted and wedged in order to prevent warping during construction. The frames shall also be protected from damage, during construction.

Measurements:

Wood work wrought and framed shall be measured for finished dimensions. No allowance shall be made for wastage and for dimensions supplied beyond those specified. Length of each piece shall be measured over all nearest to a cm. so as to include projections for tenons, scarves or metres, width and thickness shall be measured to the nearest mm.

In case of moldings, rounding's, rebates, circular and varying sections, the sectional area of the piece shall be taken as the area of the least square or rectangle from which such a section can be cut.

Rate:

The rate includes the cost of materials and labor involved in all the operations described above.

Joinery Work:

Joinery work shall be started immediately after the commencement of the building work. All prices shall be accurately cut and planed smooth to the full dimensions without any patching or plugging of any kind. Rebates, rounding and moldings as shown in drawings shall be made before assembling. The thickness of styles and rails shall be as specified for the shutters.

All members of the door shutters shall be straight without any warp or bow and shall have smooth, well planned faces at right angles to each other. The corners and edges of panels shall be finished as shown in drawings, and these shall be shall have mitered joints with the styles. Styles and rails shall be properly and accurately mortised and tenoned. Rails which are more than 180mm. in width shall have two tenons. Styles and end rails of shutters shall be made out of one piece only. The tenons shall pass through styles for at least 3/4th of the width of the style. When assembling a leaf, styles shall be left projecting as a horn. The styles and rails shall have 12 mm. groove in paneled portion for the panel to fit in.

The depth of rebate in frames for housing the shutters shall in all cases be 1.25mm and the rebate in shutters for closing in double shutter doors or windows shall not be less that 2cm. In the case of double leafed shutters, the meeting of the styles shall be rebated 20mm. The rebate shall be splayed.

The joinery work shall be assembled and passed by Architect/Consultant/ Owner/ Employer and then the joints shall be pressed, and secured by bamboo pins of about 6mm diameter. The horns of styles shall be sawn off.

Tolerance:

The finished work with a tolerance of + 1 mm in thickness + 2/3mm in width of styles and rails shall be accepted.

Glueing of Joints:

The contact surfaces of tenon and mortice joints shall be treated before putting together with bulk type synthetic resin adhesive of a make approved by Architect / Consultant / Owner / Employer. Shutters shall not be painted, oiled or otherwise treated, before these are fixed in position and passed by Architect / Consultant / Owner / Employer. Mountings and glazing bars shall be stub-tenoned to the maximum depth which the size of the member would per-

mit or to the depth of 25mm, whichever is less. Thickness of each tenon shall be approximately one third the finished thickness of the members and the width of each tenon shall not exceed five times its thickness.

Beading:

Timber, plywood, hard board and particle board panels shall be fixed only with grooves but additional beading may not be provided either on one side or on both sides. In so far as glass and asbestos panels are concerned beading shall always be provided without grooves, where beading is provided without grooves, the beading shall be only on the side, the other side being supported by rebate from the styles. For external doors and windows beading shall be fixed on the outside.

Fittings:

Details of fittings to be provided as per the schedule of fittings.

Measurements:

Length and width of the shutters shall be measured to the nearest cm. in closed position covering the rebates of the frame but excluding the gap between the shutter and the frame. Overlap of two shutters shall not be measured. All work shall be measured net as fixed.

No extra payment shall be made for shape, joints etc.

Rate:

It includes the cost of materials and labor involved in all the operations described above.

1.7 ROLLING SHUTTERS, STEEL DOORS, M. S. WINDOWS:**M.S. Door frames:**

The M.S. Door framing shall be fabricated as shown in drawing and fabricated with necessary stiffeners, hinges, holdfasts, etc. as per the drawings/sketches attached with the tender. The contractor shall quote the rate taking into account all the above requisites, including the width of frame and erecting at site in line, level, plumb, etc. and with one coat of shop paint of Red Oxide Primer. The metal door shall be stored under cover to prevent damage or distortion when taking delivery of items supplied by owner, the Contractor shall satisfy himself that the items supplied are up to the specified standard. Any defect detected shall promptly be brought to notice of Architect/Consultant/Owner/Employer.

The work shall have to be done in co-ordination with other agencies working at site.

Rolling Shutters:

The specifications shall be generally as per the manufacturer's one. However, the following may be noted. The M.S. laths for rolling shutters shall be 20 gauge and the type of rolling shutter shall be pull and push type. The workmanship should be of first-class quality. The springs and other materials shall be of best quality. The vertical guides shall be straight and of pressed type and the shutters shall be sized to suit the requirements of this tender.

M.S. Windows and Ventilators:

All windows shutters shall be fabricated to correct shape and size as per drawings approved by Company. However, before fabricating any item the contractor has to check the opening

dimensions at site. Any discrepancy therein shall be brought to Company's notice in writing mentioning the particular windows. Steel windows shall conform IS:1038 & IS:1361.

All sections for windows shall be extruded sections of approved quality. All extruded sections shall be of 14 gauge. Z sections shall be of 10-gauge sheet.

All glasses shall be standard glazing quality clear sheet glass and free from waves, specks, disfigurements or blemishes of any kind. All glasses shall be accurately cut and fitted with glazing clips or as directed by Company. The thickness of the glass will be as per the specification mention in the Bill of Quantities. Glass should be fixed in the frame with best quality putty of required thickness.

The contractor shall have to make all necessary holes in concrete masonry for fixing of windows. The contractor shall also fix and grout the shutter in line and level with his own masons.

The steel members shall be given a coat of approved anti-rust paint.

Hardware:

Peg stay arms, handles, hinges etc. shall be of approved quality and details.

Fixed or openable panels of the windows shall be as shown in the drawing.

Measurement:

The rate quoted by the contractor under each item in the Bill of Quantities for a complete finished item of and no claims by the contractor in this regard shall be admissible. Supplying and fixing of all the fittings and iron monger shall be deemed to have been included in contractor's rates and consequently, shall not be paid for separately.

The form work and scaffoldings shall be deemed to have been included in the rates quoted by the contractor and shall not be paid for separately for any of the items.

1.8 CEMENT PLASTERING (INTERNAL & EXTERNAL):

The Cement plaster shall be 6mm, 12mm or 20mm or any thickness as specified in the item.

Scaffolding:

For all exposed brick work or tile work, double scaffolding having two sets of vertical supports shall be provided. The supports shall be sound and strong, tied together with horizontal pieces over which scaffolding planks shall be fixed.

For all other brick work in buildings, single scaffolding shall be permitted. In such cases, the inner end of the horizontal scaffolding pole shall rest in a hole provided only in the header course for the purpose. Only one header for each pole shall be left out. Such holes for scaffolding shall, however, not be allowed in pillars/ columns less than one meter in width, or immediately near the skew backs of arches. The holes left in masonry works for scaffolding purposes shall be filled and made good before plastering.

Preparation of Surface:

The Joints shall be raked out properly. Dust and loose mortar shall be brushed out. Efflorescence if any shall be removed by brushing and scraping. The surface shall then be thoroughly washed with water, cleaned and kept wet before plastering is commenced.

In case of concrete surface if a chemical retarder has been applied to the form work, the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the retarders is left on the surface.

Application of Plaster:

Ceiling plaster shall be completed before commencement of wall plaster.

Plastering shall be started from the top and worked down towards the floor. All putlog holes shall be properly filled in advance of the plastering as the scaffolding is being taken down. To ensure even thickness and true surface, plaster about 15 x 15 cm. shall be first applied, horizontally and vertically at not more than 2m. intervals over the entire surface to serve as gauges. The surfaces of these gauged areas shall be truly in the plane of the finished plaster surface. The mortar shall then be laid on the wall, between the gauges with trowel. The mortar shall be applied in a uniform surface slightly more than the specified thickness. This shall be beaten with thin strips of bamboo about one meter long to ensure thorough filling of the joints, and then brought to a true surface, by working a wooden straight edge reaching across the gauges, with small upward and sideways movements at a time. Finally, the surface shall be finished off true with trowel or wooden float according as a smooth or a sandy granular texture is required. Excessive trowel in or over working the float shall be avoided. During this process, a solution of like putty shall be applied on the surface to make the later workable.

All corners, arises, angles and junctions shall be truly vertical or horizontal as the case may be and shall be carefully finished. Rounding or chamfering corners, arises, junctions etc. where required shall be done without any extra payment. Such rounding or chamfering shall be carried out with proper templates to the sizes required.

In suspending work at the end of the day, the plaster shall be left, out clean to line both horizontally and vertically, when recommencing the plastering, the edge of the old work shall be scraped cleaned and wetted with lime putty before plaster is applied to the adjacent areas, to enable the two to properly joint together. Plastering work shall be closed at the end of the day on the body of wall and not nearer than 15 cm. to any corners or arises. It shall not be closed on the body of the features such as plasters, bands and cornices nor at the corners or arises. Horizontal joints in plaster work shall not also occur on parapet tops and copings, as these invariably lead to leakages.

No portion of the surface shall be left out initially to be patched up later on.

Finish:

The plaster shall be finished to a true and plumb surface and to the proper degree of smoothness as required. The work shall be tested frequently as the work proceeds with a true straight edge not less than 2.5m. long and with plumb bobs. All horizontal lines and surfaces shall be tested with a level and all jambs corners with a plumb bob as the work proceeds.

Thickness:

The thickness of the plaster specified shall be measured exclusive of the thickness of key i.e. grooves or open joints in brick work. The average thickness of plaster shall not be less

than the specified thickness. The minimum thickness over any portion of the surface shall not be less than specified thickness by more than 3mm.

The average thickness should be regulated at the time of plastering by keeping suitable thickness of the gauges. Extra thickness required in dubbing behind rounding of corners at junctions of wall or in plastering of masonry cornices etc. will be ignored.

Curing:

Curing shall be started 24 hours after finishing the plaster. The plaster shall be kept wet for a period of seven days. During this period, it shall be suitably protected from all damages at the contractor's expense by such means as the Architect/Consultant/Owner/Employer may approve. The dates on which the plastering is done shall be legibly marked on the various sections plastered so that curing for the specified period thereafter can be watched.

Precaution:

Any cracks which appear in the surface and all portions, which should hollow when tapped or are found to be soft or otherwise defective, shall be cut out in rectangular shape and re-done as directed by Architect/Consultant/ Owner/ Employer.

1.9 CEMENT PLASTER WITH A FLOATING COAT OF NEAT CEMENT:

The cement plaster shall be 6mm, 12mm or 20mm thick, finished with a floating coat of neat cement as described in the item.

When the plaster has been brought to a true surface with the wooden straight edge it shall be uniformly treated over its entire area with a paste of neat cement and rubbed smooth, so that the whole surface is covered with neat cement slurry 1.5mm thick while the plaster surface is still fresh. Smooth finishing shall be completed with trowel immediately and in no case later than half an hour adding water to the plaster mix.

1.10 CEMENT CONCRETE FLOORING:**Cement Concrete:**

Cement concrete of specified mix shall be used and it shall generally conform to the specifications described in plain concrete.

Sub-grade:

Flooring shall be laid on concrete sub-grade where so provided. The sub-grade shall be provided with the slopes required for the flooring. Flooring in verandahs, kitchens, baths, water closets and courtyards shall invariably be provided with suitable slope to drain off washing and rain water.

If the sub-grade consists of lime concrete, it shall be allowed to set for seven days and the flooring shall be laid in the next three days.

If the sub-grade is of lean cement concrete, the flooring shall be commenced preferably within 48 hours of the laying of sub-grade. The surface of the sub-grade shall be roughened with steel wire brushes without disturbing the concrete. Before laying the flooring, the sub-grade shall be wetted and smeared with a coat of cement slurry at 2 Kgs. of cement spread over an area of one sqm. so as to get a good bond between the sub-grade and concrete floor.

If the cement concrete flooring is to be laid directly on the R.C.C. slab the surface of RCC slab shall be cleaned and the laitance shall be removed and a coat of cement slurry at 2 Kg. of cement per Sqm. shall be applied, so as to get a good bond between RC slab and concrete floor.

Thickness:

The thickness of floor shall be as specified in the description of the item.

Laying:**Panels:**

Flooring of specified thickness shall be laid in the pattern as given in the drawings or as directed by Architect/Consultant/Owner/ Employer. The border shall have mitred joints at the corners of the room and intermediate joints shall be in straight line with the panels joints shall be in straight line with the panel joints. The panels shall be off uniform size.

The panels shall be bounded by wooden angle iron battens. The battens shall have the same depth as the concrete flooring. These shall be fixed in position, with their top at proper level, giving required slopes. The surface of the batten or flats, to come in contact with the concrete shall be smeared with soap solution or non-sticking oil (Form oil or raw linseed oil) before concreting. The flooring shall butt against the masonry wall, which shall not be plastered.

The concreting shall be done in the manner described in plain cement concrete. The battens used for shuttering, shall be removed on the next day of the laying of cement concrete. The ends thus exposed shall be repaired, if damaged, with cement mortar 1:2 (1 cement: 2 coarse sand) and allowed to set for minimum period of 24 hours. The alternate panels shall then be cleaned of dust, mortar droppings etc. and concrete laid. While laying concrete, care shall be taken to see that the edges of the previously laid panels are not damaged and fresh mortar is not splashed over them. The joints between the panels should come out as fine and straight lines.

Finishing:

The finishing of the surface shall follow immediately after the occasion of beating. The surface shall be left for some time, till moisture disappears from it. Excessive trawling shall be avoided. Use of dry cement or cement and sand mixture sprinkled on the surface to stiffen the concrete or absorb excessive moisture, shall not be permitted.

Fresh quantity of cement shall be mixed with water to form a thick slurry and spread over of flooring while the concrete is still green. The cement slurry shall then be properly pressed and finished smooth.

The junctions of floor with wall plaster, dado, or skirting shall be rounded off where so specified.

The men engaged on finishing operations shall be provided with raised wooden platform to site on, so as to prevent damage to new work.

Curing:

The curing shall be done for a minimum period of ten days. Curing shall not be commenced until the top layer has hardened. Covering with empty cement gunnies shall be avoided as the color is likely to be bleached with the remnants of cement matter from the bags.

Precautions:

Flooring in lavatories and bath rooms shall be laid after fixing of water closet and squatting pans and flooring traps. Traps shall be plugged, while laying the floors and opened after the floors are cured and cleaned. Any damages done to S. C's squatting pans and floor traps during the execution of work shall be made good.

The floor shall be protected from any damage during the execution of work.

Measurements:

Length and breadth shall be measured correct to a cm. and its area as laid shall be calculated in Sqm. correct to two places of decimal Length and breadth shall be measured before laying skirting dadoo wall plaster. No deduction shall be made nor extra paid for any opening in the floor of area up to 0.10 Sqm.

Rate:

The rate shall include the cost of all matters and labor involved in all the operations described above including application of cement slurry on RCC and or on sub-grade including roughening and cleaning the surface. Nothing extra shall be paid for laying the floor at different levels in the same room or courtyard and rounding of edges of sunk floors.

In case the flooring is laid in alternate panels, it includes the cost of shuttering.

Marble Stone Flooring:

45mm thick Marble stone flooring in Ground Floor with 20mm thick White Marble stone Tiles dressed, polished and bottom coated with neat cement slurry and fixing in flooring on 25mm thick bed of cement mortar (1:1) mix and joints filled with White cement slurry, properly leveled, washed, Acid cleaned and polished.

Glazed Ceramic Tile Fixing:

66mm thick glazed ceramic tiles of size (150mm x 150mm) up to 1500mm height from floor level of approved make confirming to IS: in Dado/Skirting in toilets Ground Floor fixed in neat cement slurry after soaking the tiles in water over 12mm thick cement plaster (1:3) with white cement pointing in joint, including washing and cleaning with oxalic acid etc. complete.

8mm thick glazed ceramic tiles of size (300mm x 300mm) up to 1500mm height from floor level of approved make confirming to IS in Dado/Skirting in Operation Theater in Ground Floor fixed in neat cement slurry after soaking the tiles in water over 12mm thick cement plaster (1:3) with white cement pointing in joint, including washing and cleaning with oxalic acid etc. complete.

Kotah Stone Flooring:

50mm thick Kota stone flooring to all Toilets in Ground Floor with 25mm thick kotah stone dressed and polished tiles bottom coated with neat cement slurry and fixing in flooring on 25mm thick bed of cement mortar (1:3) mix and joints filled with gray cement slurry, properly leveled, washed, acid cleaned and polished.

Factory Made Shutters:

38mm thick fully panelled Door shutter with style and rail made out of well-seasoned chemically treated 2nd class hard wood of 100mm width style and top rail 175mm width lock all and bottom rail with 12mm inserted panels of marine grade phenol bonded BWP ply confirming to IS:303 or exterior grade pre-laminated board confirming to IS:12406/88 of approved make color and shade etc.

38mm thick Mosquito Proof Door shutter with style and rail made out of well-seasoned chemically treated 2nd class hard wood of 100mm width style and top rail, 175mm width lock rail and bottom rail with inserted panels of Galvanised Steel wire Mesh complete.

30mm thick Partly (1/3) Glazed and Partly (2/3) paneled window shutter, of 75mm width style and rail made out of well seasoned chemically treated 2nd class hard Wood with 12mm thick inserted panels of marine grade phenol bonded BWP ply confirming to IS:303 or exterior grade pre-laminated board confirming to IS:12406/88 and Glazing shall be done by 4mm thick clear Glass.

MATERIALS

Vitrified Tiles: The tiles shall be of approved make generally confirm to the approved standards. They shall be flat and true to shape, free from cracks, crazing spots, chipped edges and corners. Unless otherwise specified, the nominal sizes of tiles shall be as under:

The tiles shall be square or rectangular of nominal sizes such as: 600 x 600 mm; 900 x

900 mm or as per tender schedule / drawings or as directed by the Architect.

Thickness shall be as per recommendations of the approved manufacturers.

Technical specifications of the tiles shall be generally conforming to the following standards:

TECHNICAL SPECIFICATIONS FOR VITRIFIED TILES

- 1 Deviation in length (+/-) 0.6%
- 2 Straightness of sides (+/-) 0.5%
- 3 Rectangularity (+/-) 0.6%
- 4 Surface flatness (+/-) 0.5%
- 5 Water absorption < 0.50%
- 6 Mohs. hardness > 6
- 7 Flexural strength > 27 N / mm
- 8 Abrasion resistance < 204 mm
- 9 Skid resistance (friction coefficient) > 0.4
- 10 Glossiness Min. 85% reflection

The tiles shall conform to the relevant standards in all respects. Samples of tiles shall be got approved from the Architects and Employer before bulk procurement for incorporation in the work

1.14 CEMENT PRIMER:

Cement primer coat is used as a based coat on wall finish of cement lime or lime cement plaster or on asbestos cement surfaces before oil emulsion distemper paints are applied on

them. The cement primer is composed of a medium and pigment which are resistant to the alkalis present in the cement, lime or lime cement in well finish and provides a barrier for the protection of subsequent coats of oil emulsion distemper paints.

Primer coat shall be preferably applied by brushing and not by spraying. Hurried priming shall be avoided particularly on absorbent surfaces. New plaster patches in old work should also be treated with cement primer before applying oil emulsion paints, etc.

Preparation of the Surface:

The surface shall be thoroughly cleaned of dust, old white or color wash by washing and scrubbing. The surface shall then be sand papered to give a smooth and even surface. Any unevenness shall be made good by applying putty, made of plaster of parties mixed with water on the entire surface including filling up the undulation and then sand papering the same after it is dry.

Application:

The cement primer shall be applied with a brush on the clean dry and smooth surface. Horizontal strokes shall be given first and vertical strokes shall be applied immediately afterwards. This entire operation will constitute one coat. The surface shall be finished as uniformly as possible leaving no brush marks. It shall be allowed to dry for at least 48 hours, before oil emulsion paint is applied.

1.16 PAINTING:

Materials:

Paints, oil varnishes etc. of approved brand and manufacture shall be used ready mixed paint as received from the manufacturer without any admixture shall be used.

If for any reason thinning is necessary in case of ready mixed paint, the brand of thinner recommended by the manufacturer or as instructed by Architect / Consultant / Owner / Employer shall be used.

Approved paints, oil or varnishes shall be brought to the site of work by the Contractor in their original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a fortnight's work. The materials shall be kept in the joint custody of the contract and Architect/Consultant/Owner/Employer. The empties shall not be removed from the site work, till the relevant item of work has been completed and permission obtained from Architect/Consultant/Owner/ Employer.

Commencing Work:

Painting shall not be started until Architect/Consultant/Owner/ Employer has inspected the items of work to be painted, satisfied himself about their proper quality and given his approval to commence the painting work. Painting of external surface should not be done in adverse weather condition like hail storm and dust storm.

Painting, except the priming coat, shall generally be taken in hand after practically finishing all other builder's work.

The rooms should be thoroughly swept out and the entire building cleaned up, at least one day in advance of the paint work being started.

Preparation of Surface:

The surface shall be thoroughly cleaned and dusted. All rust, dirt, scales, smoke and grease shall be thoroughly removed before painting is started. The prepared surface shall have received the approval of the Architect/Consultant/Owner/Employer after inspection, before painting is commenced.

Application:

Before pouring into smaller containers for use, the paint shall be stirred thoroughly in its containers, when applying also the paint shall be continuously stirred in the smaller containers so that its consistency is kept uniform.

The painting shall be laid on evenly and smoothly by means of crossing and laying off, the later in the direction of the grain of wood. The crossing and laying off consists of covering the area over with paint, brushing the surface hard for the first time over and then brushing alternately in opposite direction, two or three times and then finally brushing lightly in a direction at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. The full process of crossing and laying off with constitute one coat.

The left over paint shall be put back into the stock tins. When not in use, the containers shall be kept properly closed.

No hair marks from the brush or clogging of paint putties in the corners of panels, angles of mouldings etc. shall be left on the work.

In painting doors and windows, the putty round the glass panes must also be painted, but care must be taken to see that no paint stains etc., are left on the glass. Tops of shutters and surfaces in similar hidden locations shall not be left out in painting.

In painting steel work, special care shall be taken while painting over bolts, nuts, rivets, overlaps etc.

The additional specifications for primer and other coats of paints shall be as according to the detailed specifications under the respective headings.

Brush and Containers:

After work, the brushes shall be completely cleaned of paint and linseed oil by rinsing with turpentine. A brush in which paint has dried up is ruined and shall on no account be used for painting work. The containers when not in use, shall be kept closed and free from air so that paint does not thicken and also shall be kept safe from dust. When the paint has been used, the containers shall be washed with turpentine and wiped dry with soft clean cloth, so that they are clean and can be used again.

Measurements:

The length and breadth shall be measured correct to a cm. The area shall be calculated in Sq. metres (correct to two places of decimal), except otherwise stated, small articles not exceeding 10 sq. decimetres (0.1 Sqm.) of painted surfaces where not in conjunction with similar painted work shall be enumerated.

Painting up to 15 Cm. in width or in girth and not in conjunction with similar painted work shall be given in running metres.

Priming coat on wood, Iron or Plastered Surface:**Primer:**

The primer for wood work, iron work or plastered surface shall be as specified in the description of the item.

The primer shall be ready mixed primer of approved brand and manufacture.

Preparation of Surface:**Wooden Surface:**

The wood work to be painted shall be dry and free from moisture. The surface shall be thoroughly cleaned. All unevenness shall be rubbed down smooth with sand paper and shall be well dusted. Knots, if any shall be covered with preparation of red lead made by grinding red lead in water and mixing with strong glue sized and used hot. Appropriate filler material with same shade as paint shall be used where specified.

The surface treated for knotting shall be dry before painting is applied. After the priming coat is applied the holes and indentation or the surface shall be stopped with glazier's putty or wood putty respectively. Stopping shall not be done before the priming coat is applied as the wood will absorb the oil in the stopping and the latter is therefore liable to crack.

Iron & Steel Surface:

All rust and scales shall be removed by scraping or by brushing with steel wire brushes. Hard skin of oxide formed on the surface of wrought iron during rolling which becomes loose by rusting shall be removed.

All dust and dirt shall be thoroughly wiped away from the surface. If the surface is wet, it shall be dried before priming coat is undertaken.

Plastered Surface:

The surface shall ordinarily not be painted until it has dried completely. Trial patches of primer shall be laid at intervals and where drying is satisfactorily, painting shall then be taken in hand. Before primer is applied, holes and undulations, shall be filled up with plaster of Paris and rubbed smooth.

Application:

The primer shall be applied with brushes, worked well into the surface and spread even and smooth. The painting shall be done by crossing and laying off as described in painting.

All other the specifications described under painting shall hold good so far as they are applicable.

Painting with ready mixed paint:

Ready mixed paints of approved brand and manufacture and of the required shades shall be used. They shall conform in all respects to the relevant IS specifications.

Painting of New Surface:

- a) Wood work - The surface shall be cleaned and all unevenness removed as specified in priming coat on wood, iron & plastered surface. Knots if visible, shall be covered with a preparation of red lead. Holes and indentations on the surface shall be filled in with glazier's putty or wood putty and rubbed smooth before painting is done. The surface should thoroughly dry before painting.
- b) Iron and Steel Work - The priming coat shall have dried up completely before painting is started. Rust and scaling shall be carefully removed by scraping or by brushing with steel wire brushes. All dust and dirt shall be carefully and thoroughly wiped away.
- c) Plastered Surface - The priming coat shall have dried up completely before painting is started. All dust and dirt that has settled on the priming coat shall be thoroughly wiped away before painting is started.

The specifications described in painting shall hold good as far as applicable. The number of coats to be applied will be as stipulated in the item. The painted surface shall present a uniform appearance and glossy finish, free from streaks, blisters, etc.

Painting on Old Surface:**Preparation of Surface:**

- a) Wood work - If the old paint is sound and firm and its removal is considered unnecessary, the surface shall be rubbed down with pumice stone after it has been cleaned of all smoke and grease by washing with lime and rinsing with water and drying. All dust and loose paint shall be completely removed. The surface shall then be washed with soap and water.
- b) Plaster surface - It shall be as specified for (a) wood work.

If before painting any portion of the wall shows signs of dampness, the causes shall be investigated and the damp surface shall be properly treated. Such treatment shall be paid for separately. A thin coat of white lead if so, required shall be applied on the wet or patchy portion of the surface before painting is undertaken and this shall be paid extra.

- c) Aluminum Paint - Aluminum paint of approved brand and manufacture shall be used. The paint comes in compact dual containers with the paste and the medium separately. The two shall be mixed together to proper consistency before use. Each coat shall be allowed to dry for 24 hours and lightly rubbed down with fine grade sand paper and dusted before the next coat is applied. The finished surface shall present an even and uniform appearance. As aluminum paint is likely to settle in the container, care shall be taken to frequently stir the paint during use. Also, the paint shall be applied and laid off quickly, as surface is otherwise not easily finished.

Painting with Wood Preserved:

Oil type wood preservative of specified quality and approved make conforming to IS: 218-1961 shall be used. Generally, it shall be creosote oil type-1 or anthracene oil.

Painting on New Surface:

Preparation of surface:

Painting shall be done only when the surface is perfectly dry to permit of good absorption. All dirt, dust or other foreign matter shall be removed from the surface to be painted. All roughness shall be sand papered and cleaned.

Application:

The preservative shall be liberally with a stout brush and not daubed with rags or cotton waste. It shall be applied with a pencil brush at the joints of the wood work. The first coat shall be allowed at least 24 hours to soak in before the second (the final) coat is applied. The second coat shall be applied in the same manner as the first coat. The excess of preservative which does not soak into the wood shall be wiped off with a clean dry piece of cloth.

The specifications described in painting shall hold good in so far as they are applicable.

Structural Steel Work and Asbestos Work:**Structural Steel Work:**

The work covered by this contract comprises the supply, fabrication and erection of structural steel work in accordance with the drawings, furnished by Company and as directed in the Bill of Quantities and Specifications hereinafter.

The static calculations shall be worked out by Company. The current rules and practices set forth in the latest Indian Standards for materials, fabrication and erection of structural steel work including metal are welding shall be strictly followed unless otherwise indicated hereinafter.

In case the Contractor wishes to suggest certain alterations substitutions or modifications of design, sections, details, etc. he shall provide the necessary drawings therefore together with calculations and details. These details shall be checked by Company and approved.

It is intended that the drawings and specifications include everything requisite and necessary to finish the work properly notwithstanding the fact that every time may not be specifically mentioned. All supplementary parts such as bolts, clips and angles necessary to complete each item shall be deemed to be included though not specifically stated. All work when finished shall be delivered in a complete and undamaged state.

Materials:

All material (such as structural, steel, rivet steel and electrodes) required for the work shall be best tested quality conforming strictly to the relevant Indian Standard Specifications. Materials shall be free from scale, blisters, Laminations cracked edges and other defects.

Workmanship (Fabrication):

All workmanship shall be first quality in every respect, greatest accuracy being observed to ensure that all parts will fit together properly on erection.

All ends shall be cut true to fit the abutting surfaces accurately. Butt ends of compression members shall be in close contact through the area of the joint. Stiffeners, if any, shall bear tightly at both ends.

Shop Drawings:

The Contractor shall submit 3 sets of shop and erection drawings with erection sequence necessary for the construction for approval of Company free of charge. No fabrication work shall be undertaken until the written approval is obtained from Company. The approval of drawings by Company, Indicates only the general method of construction and that the detailing is satisfactory. Approval of such drawings shall not relieve the contractor of the responsibility for any errors or compliance with the requirements of contract, plans and specifications. The contractor shall be responsible for the dimensions and designs of adequate connections, supports, details and satisfactory construction of the work.

Welding:

Welding shall be permitted to be carried out by licensed welders. All welding work shall be fillet welds in general and shall strictly conform to the relevant Indian Standards. The diameter of the electrodes, the throat thickness of the weld, etc. shall be as per Standard Practice or as directed.

Riveting:

Where necessary shall be Machine riveting and shall be carried out all as laid down in the relevant Indian Standards.

Shop Erection:

If so directed, the fabrication steel work shall be shop erected to check the accuracy of fit and fabrication.

Erection and making at Site:

During erection, the work shall be securely braced and fastened temporarily to provide safety for all erection stresses at. No. permanent bolting or riveting or welding shall be carried out until proper alignment has been obtained.

Painting:**a) Shop Coat:**

All Steel work shall be properly cleaned of all loose mill scale, rust, dirt and other foreign matter. Except where encased in concrete and surface area adjacent to edges to be field welded all steel work shall be given one coat of approved anti-rust (Red Oxide) well worked into the joints. All paint shall be applied to dry surfaces.

b) Inaccessible Parts:

Parts inaccessible after assembly shall be given two coats of shop paint of different shade No spots of bottom coat shall show through.

c) Contact surface:

All contact surfaces shall be properly cleaned by effective means but not painted.

d) Surface to be filled welded:

Surfaces which are to be welded after erection shall where practicable not receive a shop coat of paint. If painted, such paint shall be removed before field welding for a distance of at least 50mm on either side of the joint.

Measurements:

The measurements shall be as per the final fabrication drawings. Payment shall be made on the actual tonnage erected. The rate quoted shall be inclusive of welding, riveting or bolting and grouting bolts. The latest code of practice of Indian Standard Institution for Method of Measurement purposes.

Asbestos Work:**Scope of work:**

The work under this contract comprises of the following:

- a) A.C. Sheet Roofing with accessories
- b) A.C. Gutters with accessories
- c) A.C. Sheet Cladding.

Materials:

Asbestos Cement Sheets for roofing, cladding and A.C. rain water gutters shall be procured from the approved manufacturer.

Roofing and cladding shall be carried out with "Corrugated Sheets".

Workmanship:

Workmanship shall be strictly in accordance with the Code of Practice issued by Asbestos Cement Co. and will conform with the drawings and instructions issued by Consultants.

A.C. Sheets for roof and cladding will be procured in the specified sizes so as to minimize the wastage.

Corrugated sheets in roof shall be laid from right to left. The first sheet shall be laid uncut but the remaining sheets in the bottom shall have the top right and corners cut of miters. The sheets in the second and other intermediate rows shall have the bottom.

Wherever four sheets met at a lap, two of them shall be mitered to provide a snug fit. The length of mitre shall be 20 cm. width equal to the width of the corrugation. Mitering shall be done with an ordinary wood saw.

The ends of all sheets at the eaves shall be supported and the support shall be placed as near to the margin of the sheets as practicable.

Cat ladders or roof boards shall be used when working to avoid damage to the sheets and to provide security to workmen. These shall also be used when fixing roofing accessories, gutters and accessories.

Corrugated sheets shall be laid with smooth side upwards. End mark 'Top' on the smooth side always point the ridge. End lap in sheets shall be 20 Cm. and side lap shall be on one corrugation, the left-hand small corrugation of each sheet being covered by the right hand large corrugation of the next sheet.

Holes in A.C. sheets for fixing shall be 11.11 mm (7/16") dia drilled never punched, in the crown of the corrugation. Fixing bolts, screws shall be 7.94mm (5/16") dia and all fixing accessories including nuts and washers shall be galvanized iron. "Everest" bitumen washer shall be screwed lightly at first and lightened when a dozen or more sheets are laid screwing the sheets down too lightly on the purlins will be avoided. Every vertical side lap corrugation will carry a fixing accessory also as the urges and also through one of the two intermediate corrugations on each sheet. When the sheets are supported one intermediate purlin as in the case of lengths over (1.83m) and additional fixing accessory shall be provided through each side lap corrugation only.

A.C. gutter shall be supported along its girth through its length by adjustable brackets fabricated out of suitable M.S. straps at approx. 45 cm. c/c fabricated to the same profile as the gutter is fixed to the adjacent M.S. tuners/purlins by suitable M.S. accessories.

Gutters and accessories to be joined shall be perfectly dry and clean. Asbestos ropes 6.35mm (1/4") dia smeared with "Everest" bitumastic jointing compound shall be placed on both sides of the union clip, 1.25cm. inside from the edge along its inner coutow.

The space between the ropes shall be filled with "Everest" bitumastic jointing compound and levelled uniformly with a piece of wood or the edge of a trowel to the height of the rope.

Gutters and accessories shall be placed in position with 1.59mm (1.16") dia space between the butt joints and the prepared union clip shall be fixed underneath the butt joint.

From the inside the gutter 7.94mm (5/16") dia. G.T. Seam bolts shall be inserted in the ready drilled holes with an "Everest" bitumen washer adjacent to the gutter and a G.T. flat washer in top of it and shall be screwed with a nut.

The bolts shall be so positioned that "Everest" bitumen washers shall be correctly centred on the holes in the gutter as also in the union clip.

Over tightening of nuts shall be avoided to prevent sheets from cracking.

After a complete gutter line has been fixed in position all brackets supporting the gutter shall be adjusted to give the required slopes towards the gutter outlets.

Gutter line shall be tested for water tightness after jointing. All outlets shall be plugged and the entire length of the gutter line filled with water and retained these for 24 hours for observations.

Measurements:

The sloping area of roof coverings and claddings as laid shall be measured in square meters without allowance for laps and corrugations, if any.

Portions of roof covering overlapped by ridge or hip etc. shall be included in the measurements of the roof.

Any opening not exceeding 0.4 Sqm. shall not be deducted and forming such openings requiring cutting shall be enumerated.

Any opening exceeding 0.4 Sqm. shall be deducted and cutting required shall be measured in running meter.

WOOD COMPOSITE DOOR/FRAME WORKS

WPC FRAMES: The factory made single extruded WPC (Wood Polymer Composite) solid door/window/Clerestory windows & other Frames/Chowkhat comprising of virgin PVC polymer of K value 58-60 (Suspension Grade), calcium carbonate and natural fibers (wood powder/ rice husk/wheat husk) and non toxic additives (maximum toxicity index of 12 for 100 gms) fabricated with miter joints after applying PVC solvent cement and screwed with full body threaded star headed SS screws having minimum frame density of 750 kg/cum, screw withdrawal strength of 2200 N (Face) & 1100 N (Edge), minimum compressive strength of 58 N/mm², modulus of elasticity 900 N/mm² and resistance to spread of flame of Class A category with property of being termite/borer proof, water/moisture proof and fire retardant and fixed in position with M.S hold fast/lugs/SS dash fasteners of required dia and length complete as per direction of Engineer-In- Charge. (M.S hold fast/lugs or SS dash fasteners shall be paid for separately).

Note: For WPC solid door/window frames, minus 5mm tolerance in dimensions i.e depth and width of profile shall be acceptable. Variation in profile dimensions on plus side shall be acceptable but no extra payment on this account shall be made.

WPC DOORS: The factory made single extruded WPC (Wood Polymer Composite) solid plain flush door shutter of required size comprising of virgin polymer of K value 58-60 (Suspension Grade), calcium carbonate and natural fibers (wood powder/ rice husk/wheat husk) and non toxic additives (maximum toxicity index of 12 for 100 gms) having minimum density of 650 kg/cum and screw withdrawal strength of 1800 N (Face) & 900 N (Edge), minimum compressive strength 50 N/mm², modulus of elasticity 850 N/mm² and resistance to spread of flame of Class A category with property of being termite/borer proof, water/moisture proof and fire retardant and fixing with stainless steel butt hinges of required size with necessary full body threaded star headed counter sunk S.S screws, all as per direction of Engineer-In-Charge. (Note: stainless steel butt hinges and necessary S.S screws shall be paid separately)

UNPLASTICIZED POLY-VINYI CLORIDE (uPVC) WORKS

The factory made uPVC glazed/wire mesh windows/doors comprising of lead free uPVC multi-chambered frame, sash and mullion/coupler (where ever required) extruded profiles having minimum wall thickness of 1.70 mm for Series R1 and R2 profiles and 2.10 mm for Series R3 and R4 profiles conforming to EN: 12608 in any shape, colour and design duly reinforced with galvanized mild steel section made of required shape & size as per CPWD Specification, uPVC

extruded glazing beads, interlocks and Inline sash adaptor (where ever required) of appropriate dimension, EPDM gasket, hardware, SS 304 grade fasteners of minimum 8 mm dia with countersunk head, comprising of matching polyamide PA6 grade sleeve for fixing frame to finished wall as per IS 1367 : Part 1 to 14, plastic packers, plastic caps and necessary stainless steel screws etc. Profile of frame, sash & mullion (if required) shall be mitred cut and fusion welded/mechanically jointed duly sealed at all corners, including drilling of holes for fixing hardware and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with weather proof silicon sealant over backer rod of ap-

proved size and quality, all complete as per approved drawing conforming to CPWD specification & direction of Engineer-in-Charge. Section of steel reinforcement and cross sections of uPVC profiles to be as per design approved by Engineer-in-Charge.

Wire mesh / Glazing of plain/ toughened/ laminated/ double glass unit with / without high performance coatings as per design requirements and conforming to IS: 3548 & IS: 16231 shall not be paid separately, window with frame, glazing necessary hardware shall paid as one item.

Note:- Structural design proof checked from a Government Engineering Institute, to be provided by the manufacturer for :

- (i) Sites with basic wind speed > 45 m/sec as per IS 875 — Part 3
- (ii) Sites with structure height more than 20m for all wind speeds

HPL (HIGH PRESSURE LAMINATE) WORKS AT ALL HEIGHT

Procurement of manufacture's specification such as fundermax 6mm thick exterior grade F-quality panels of standard size with both side décor. Fundermax exterior panels are duromer high-pressure laminates (HPL) as per EN 438-6 type EDF manufactured with norm conformity of EN 438-7 using patented NT technology (NT is Non fading high performance acrylic polyurethane surface technology). Panels will be double hardened including acrylic polyurethane resin and thermally cured under high pressure. These panels will have CE-mark necessary for their use in building applications. Installation of Funder max panels will be done by MBE rivets (with fixed and sliding points) with recommended Aluminium section of 2 mm thick and L section 2 mm thick held by Aluminium wall bracket with wind load and dead load slot as per design, anchored by standard anchor fasteners along with Thermal separator. Design of Aluminium should be submitted to the architect with design calculation, Installation of fundermax panels will be done using rear ventilated principles only, which is ensured by providing ventilation gap minimum 200cm²/per meter (for free flow of air behind the façade) for the façade and using the framework with no horizontal section.

Guarantee:

The Contractor shall be required to furnish a guarantee in respect of the water tightness of the roof for a period of one year from the date of final completion of work.

LIST OF MATERIALS OF APPROVED BRAND AND MANUFACTURE

No	Item	Approved make
1	Cement (PPC)	Ultratech (Super), OCL, Dalmia DSP, ACC, Lafarge
2	RMC	Ultratech RMC, Duramix, Kalinga RMS, RDC, Nuvoco RMC as approve by Engineer in charge/Architect
3	Sand (coarse and fine)	Locally available good quality river sand
4	Brick (Fly ash)	Locally available good quality bricks
5	Steel (TMT FE 500 grade)	TATA TISCON 500SD /SAIL TMT EQR 550 /JINDAL PANTHER 550D/VIZAG STEEL
6	Floor and wall tiles (ceramic/Vitrified)	Somany, Johnson, Kajaria, NITCO

7	Tile Adhesive	Sika, Fosroc, MYK Laticrete, Bal endura /Roff
8	Construction Chemicals	Sika/Fosroc/MYK Laticrete/Dr Fixit/ Roff
9	Paints, putty, primer (Exterior and interior)	Berger, Asian, ICI
10	Glass	Saintgobain/ Modi/Tata/Asahi
11	Concrete Cover	Astra/ equivalent
12	Flush door	Century/Sylvam/Green
13	AAC Block	Ultractech/Fast build block/ ABSS construction/ equiv as approved
14	WPC door & frames	Duroplast/Fenesta/Symta/Prominence
15	uPVC windows & frames	Duroplast/Fenesta/Symta/Prominence
16	HPL	FunderMax / Trespa / RHEAU
17	GI sheet/Angles	JINDAL/TATA/SAIL
18	STAILESS STEEL	JINDAL/SALEM-SAIL/RINL/TATA
19	Water Proofing Compound	Pidilite/Sika/Fosroc/Dr.Fixit
20	Aluminium section	Hindalco/ Jindal/OEL

Volume – II

TECHNICAL SPECIFICATIONS FOR PUBLIC HEALTH WORKS

TECHNICAL SPECIFICATIONS FOR SANITARY FITTINGS

- 1.0 SANITARY WARES AND ALLIED FITTINGS.** All sanitary wares with their allied fittings must be first quality (best) of approved make and brand.
- 2.0 SQUETTING PATTERN W.C. PAN (INDIAN TYPE):** The W.C. Pan shall be of white vitreous China of specified size and pattern (Orissa or long pattern as specified) with an integral flushing rim. It shall have the flushing horn in the back unless it is not possible to accommodate cistern to suit this design. The pan shall be of approved quality. It shall have 100 mm. C.I. or porcelain trap 'P' or 'S' type with minimum effective seal of 50 mm. and 50 mm. vent arm.
- 2.1 FIXING OF W.C. PAN:** The squatting type W.C. pan shall be sunk in floor sloped towards the pan in a workmanship like manner, care being taken not to damage then pan in the process of fixing. It damaged in any way it shall be replaced at contractors' cost. It shall be fixed on a proper cement concrete base of 1:3:6 proportion taking care that the cushion is uniform and even without having any hollows between the concrete base and pan and finished just below level of rim of pan to receive the specified thickness of the floor finishing. No extra for concrete bed shall be paid for.
- The joint between the pan and the trap shall be made with cement mortar 1:1 and shall be leak proof.
- 3.0 PEDESTAL WASH DOWN SYPHONIC (SINGLE OR DOUBLE TRAP) WATER CLOSET (EUROPEAN TYPE):** The W.C. Pan shall be of white vitreous chine unless otherwise specified of one piece construction of wash down type with integral 'P' or 'S' trap as required. It shall be of approved quality and pattern.
- 3.1 INSTALLATION:** The weight of the fixture and user are supported on the floor and not on the drainages pipe and this should be done in standard approved method.
- 3.2 SEAT AND COVER:** The double solid seat with lid shall be of well-seasoned teak wood varnished or mahogany polished or plastic seat as specified with rubber buffers and shall be fixed in position by using chromium plated brass hinges and screws. The seat shall be nonabsorbable and free from cracks and crevices in the materials. The plastic seat and cover, where specified, shall conform to I.S. specifications and shall be of white color unless otherwise specified.
- 4.0 FLUSHING:** The flushing of the squatting and pedestal W.C. pan shall be done by low level valve less symphonic flushing cistern of approved quality and capacity as specified. In the former case the connection between the flush pipe of the cistern and

W.C. pan shall be made by Rigid PVC pipe connection as specified. The other specification will be as for squatting pattern W.C. pan.

The flush pipe shall be fixed to wall by using holder bat clamps or embedded as required.

As specified low level Cisterns of specified capacity shall be fitted with all internal fittings brackets and C.P. brass flushing handle, and connected to the W.C. pan by means of 40 mm. diameter chromium plated brass bend and rubber or any other as specified.

- 4.1 BRACKETS:** The cistern shall be fixed on cast Iron or rolled steel cantilever brackets of required strength which shall be firmly embedded in the wall or fixed by using wooden plug and secret, to the satisfaction of the Consultant/Employer. Depending on the quality of work and type of sanitary fixtures, the fixing of cistern should vary in quality of materials and design also. Or it may be installed in other ways like placing on the top at the back of the W.C.
- 4.2 OVERFLOW:** The cistern shall be provided with 20 mm. pipe with fittings which shall terminate into mosquito proof coupling secured in a manner that will permit it to be readily cleansed or renewed, when necessary.
- 4.3 FLUSH PIPE.:** Unless otherwise stated in the schedule of quantities, the outlet or flush pipe from the low level cistern shall be of 40 mm. Rigid PVC/Brass chromium pipe minimum thickness of 2.6 mm. as specified or P.V.C. pipe as required by the Consultant/Employer which shall be connected to the W.C. pan by means of an approved type of joint adapts. The flush pipe shall be fixed to wall by using holder bat clamps or embedded as required.
- 4.4. PAINTING C.I. CISTERN:** Inside of cisterns and fittings shall be painted with approved bituminous paint and outside of the cisterns, if required, brackets, overflow and flush pipes, if required, etc. shall be painted with two coats of synthetic enamel paint of approved shade and make to given an even appearance. The cost of such painting shall be included in the rate quoted for the flushing cistern.
- 5.0 STANDING URINALS:**
- 5.1 BOWL URINAL:** The urinal shall be flat back or angular pattern lipped front basin of required dimensions of white vitreous china and one piece construction with internal flushing box rim of an approved make as specified. It shall be fixed in the position by using wooden plug embedded in the wall with screw of proper size. Each urinal shall be connected to a 40 mm. diameter waste lead pipe unless otherwise specified, which shall discharge into a channel or a floor trap, or as specified.
- 5.2 HALF STALL URINALS:** The urinal stall and its screen shall be of white vitreous china of approved quality and manufacturer. The stall shall be 114 cm. high and 46 cm. wide and 40 cm. deep. the stall shall be provided with 84 cm. x 36 cm. division plates. In case of two or more urinals there shall be further division plates similar to end screens. The range shall have 15 cm. deep tread plates of first-class quality unless otherwise specified.
- 5.3 FLUSHING:** Where not specified the stall shall be provided with white glazed vitreous china automatic flushing cistern of proper capacity with 6 mm. minimum body

thickness unless otherwise specified. The cistern shall be complete with fittings and brackets which shall be fixed to the wall. The cistern shall be connected to the stall through standard size C.P. brass flush pipe with spreader arrangement and clamp unless otherwise specified. Where the cistern has not been specified it will be from distribution line through Brass C.P. connector and spreaders.

5.4 OUT-LET. Each of half stall shall be provided with C.P. Brass outlet (dome shape) grating of size 32 mm. for each half stall and then through PVC pipe to urinal channel.

6.0 SQUATTING URINALS.

6.1 SQUATTING PLATES.: The urinal plates shall be of white glazed vitreous chine integral flushing rim of size 600 mm. x 350 mm. as specified. There shall be white vitreous channel with stop and outlet pieces in front. The plate and channel shall be of approved quality.

The joint between the urinal plate and the flush pipes shall be made with putty or white lead mixed with chopped hemp.

6.2 OUT-LET: The squatting plate or a range of squatting plates shall be provided with a 65 mm. diameter standard urinal C.I. trap with vent arm having 65 mm. C.P. brass out-let grating or as specified.

6.3 WALLING.; The squatting plate shall have 1.22 M. high wall in front and on either side. These shall be lined as specified.

7.0 CISTERN.

7.1 MATERIAL.: If not specified a high-level cistern is intended to operate with a minimum height of 191 cm. and a low-level cistern within the height of 60 cm. approx. from the floor finish and the underside of the cistern.

The body thickness of an earthenware cistern 1.3 cm. The cistern with internal parts shall be free from manufacturing faults and other defects and operate smoothly and efficiently. The cistern shall be considered mosquito proof only if there is no clearance anywhere which would permit a 1.6 mm. wire to pass through coupling in the permanent position (i.e; flushing or filling) of the cistern. The outlet fitting of each cistern shall be securely connected to the cistern. In the case of outlet shall be from low level 40 mm. dia. (nominal bore). The outlet of flush pipe from the cistern shall be connected to the pan by means of putty or cement and for E.P.W.C. with rubber joint and putty. The flush pipe shall be fixed to wall by using holder bath clamp.

The discharge rate of cistern shall be about 5 liters in 3 seconds when connected to an appropriate flush pipe and there shall be no appreciable change in the full discharge. The cistern shall have discharge capacity of 5, 10, 12.5, 13, liters with tolerance of +/-0.5 liter and 15 liters with tolerance of +/-1 liter.

The cistern for a `Stall' type urinal or a W.C. may depending an situation be of glazed vitreous china, color or white with the best quality fittings including brackets, as specified.

7.3 FOR SQUATTING PLATE URINAL:

Capacity : The capacity of the flushing cistern and the size of the flush pipe for the number of squatting plate urinals in a range will be as follows.

Number of urinals of range	Capacity of flushing cistern.	Size of flush pipe Main Distribution.
1	5 liters	25 mm
2	10 liters	25 mm
3	15 liters	32 mm
4	15 liters	32 mm

The cistern shall be fixed on R.S. or C.I. cantilever brackets of requisite strength which shall be embedded or fixed to the wall by means of wooden plug and screws.

8.0 WASHING BASINS

8.1 BASIN: The wash basins shall be of white or colored vitreous china as specified and of approved quality, make and pattern. It shall be one-piece construction with an integral combined overflow. The size of the basin shall be as specified.

8.2 FITTINGS: Each wash basin shall be provided with 15 mm C.P. brass pillar taps as specified, 32 mm C.P. waste - chain and rubber plug, unions, joints etc. complete in all respects of approved quality.

8.3 FIXING. The basin shall be supported on a pair of M.S. or C.I. Cantilever or Nylon type brackets of requisite strength embedded or fixed in position by means of wooden cleats and screws. These metal brackets shall be painted to the required shade including a coat of anti-corrosive paint. The plaster on the rear shall be cut to overhang the top edge of the basin.

8.4 WASTE CONNECTION. The waste shall discharge into a floor trap leading to a gully trap, on ground floor and on upper floor it may be connected to waste pipe stack.

Where specified wash basins shall be provided with a 20 mm. G.I. puff pipe terminating with a brass perforated cap screwed on to it on the outside of the walls or connected to anti-siphoned stack. When the waste pipe discharges freely into a channel or floor trap and is of short length without any bends, no puff will be necessary.

9.0 KITCHEN SINKS: Unless otherwise mentioned the kitchen sink with drain boards shall be of stainless steel and of approved quality, make and pattern. It shall be of one-piece construction with an integral combined overflow, the size of the sink & drain board shall be as specified.

9.1 FITTINGS: Each sink shall be provided with 15 mm. brass C.P. long body bib cock, 40/32 mm. waste, chain and rubber plug, unions joint etc. complete in all respects as specified and of approved quality.

- 9.2 FIXING:** The sink shall be supported on a pair of M.S. or C.I. cantilever brackets or requisite strength embedded or fixed in position by means of wooden cleats and screws. The brackets shall be painted to required shade including a cost of anticorrosive paint.
- 9.3 WASTE CONNECTION:** The waste shall discharge into a flow trap leading to a gully trap, on ground floor and on upper floor it may be connected to waste pipe stack with bottle tap/PVC waste pipe.
- 10.0 TOILET REQUISITES.**
- 10.1 MIRROR:** The mirror shall be of approved make glass with beveled edges. The size and shape of the mirror shall be as specified. It shall be mounted on an asbestos sheet and shall be fixed in position by means of 4 C.P. brass screws and washers over rubber washers and wooden plugs firmly embedded in the wall C.P. brass clamps with C.P. screws an alternatively with fiber glass frame.
- 10.2 SHELF.** The shelf shall be of glass of approved quality with edge rounded off or of vitreous china (colored or white) of approved make. The size of the shelf shall be as specified. The shelf shall have C.P. brass or aluminum guard rail with rubber washers on positions resting on glass plate and C.P. brass or aluminum brackets which shall be fixed with C.P. brass or aluminum screws to wooden plugs firmly embedded on the wall.
- 10.3 TOWEL RAIL.** The towel rail shall be of C.P. brass or aluminum with two C.P. brass or aluminum brackets. The size of the rail shall be as specified. The bracket shall be fixed by means of C.P. brass or aluminum screws to wooden cleats firmly embedded in the wall.
- 10.4 CHROMIUM PLATED STOP COCK, TAPS, BIB COCKS, SHOWER SET, GUN-METAL PEETS VALVES:** If not mentioned otherwise schedule, cocks and taps are to be of brass standard head chromium plated of approved make and pattern. They must be capable to withstand at least 10.5 Kg/Sqcm pressure applied for 5 minutes without leakage. The valve is to be of peet type gunmetal valves. Other conditions remain same as cocks and taps.
- 10.5 LIQUID SOAP HOLDER:** This shall be glass or P.V.C. or C.P. brass specified. It shall be fixed in position by means of C.P. brass screws to wooden cleats embedded in the wall. The liquid soap holder shall be of approved make.
- 10.6 TOILET PAPER HOLDER.** The paper holder shall be of C.P. brass or vitreous china as specified. The rolled wooden paper holder shall be made of well-seasoned teak wood.

TECHNICAL SPECIFICATION FOR INTERNAL SANITARY INSTALLATIONS AND DRAINAGE WORK

1.0 GENERAL SPECIFICATIONS

All water supply, internal sanitary installation and drainage work will be carried out by skilled and licensed plumbers in proper workmen like manner complying in all respect with the requirement of the relevant by laws. Preparation and obtaining sanction of

drainage and water supply plans, necessary punching of G.I. pipes and fittings from statutory body, which will be incorporated in the work, including any charges if payable to the Municipal or to the local bodies in whose jurisdiction the work is to be executed, shall be borne by the contractor. Items of works not covered by the Technical Specification shall be carried out as per best practice according to the direction of the Architect / Consultant / Owner / Employer. Unless otherwise specified in the general cost of all stages of works mentioned in the schedule of quantities shall be deemed included in the rates of the items.

2.0 LAYING AND JOINTING OF HCI PIPES AND FITTINGS EXTERNAL WORKS

H.C.I. pipes and fittings: Cast iron, soil waste and vent pipes and fittings where specification shall conform to the latest B.S. 1729 for these pipes. The pipes shall have spigot and socket ends.

Weight: Standard weight and thickness of pipes are given below and a tolerance upto 10% may however be followed against these standard weights.

Sl. No.	Nominal dia of pipe	<u>Soil Waste & Vent Pipes I.S. 1729-1964</u>	
		Minimum Thickness	Nominal weight for 1.8 M long pipe exclusive of ears
1.	50	5	11.41
2.	75	5	16.52
3.	100	5	21.67
4.	150	5	31.92

These shall be free from cracks and other flaws. The interior of pipes and fittings shall be clean and smooth and painted inside with an approved anti-corrosive paint.

Laying Any deviation either in plan or elevation less than $11 - \frac{1}{4}$ degree shall be effected by laying the straight pipes round a flat curve of such radius that minimum thickness of lead at the face of the socket shall not be reduced below 6 mm or the opening between spigot and socket increased beyond 12 mm at any joint. A deviation of about $2 - \frac{1}{4}$ degree can be effected at each joint in this way. At the end of each day's work the last pipe laid shall have its open ends securely closed with a wooden plug to prevent entry of water, soil, rats and any other foreign matter into the pipe.

Lead Caulked Joints with Pig Lead This type of lead caulking is generally done in providing joints in gas water and sewer lines wherever it is practicable to use cost lead caulking, but not in case of wet conditions. The approximate depth and weight of pig lead for various diameters of C.I. pipes and special shall be as given below.

LEAD FOR DIFFERENT SIZES OF PIPES

Nominal Size of Pipe	Lead / Joint (Kg.)	Depth of Lead Joint (mm)
88	1.8	45
100	2.2	45

Note – The quantity of lead given in the table are provisional and a variation of 20 percent is permissible.

Just sufficient quantity of spun yarn shall be put so as to give the specified depth of lead.

JOINTING: The spun yarn shall first be inserted and caulked into the socket as described under jointing with pig ead. Lead wool or yarn shall then be introduced in the joint in strings not less than 6 mm thick and the caulking shall be repeated with each turn of lead wool or yarn. The whole of the lead wool or yarn shall be compressed into a dense mass. The joint shall then be finally finished flushes with face of the socket.

TESTING: All H.C.I. pipes and fittings including joints shall be tested by smoke test and left in working order after completion. The Contractor shall have to rectify all defects traced in such tests of his own expenses to the complete satisfaction of the Architect /Consultant / Owner / Employer.

PAINTING: All exposed H.C.I. pipes and fittings shall be painted with the approved colour with two coats of 1” quality synthetic enamel paint over a coat of primer including preparation of surface.

MEASUREMENTS: The net length of pipes as laid or fixed, shall be measured in the running meters correct to a cm. specials shall be excluded and enumerated separately. The portion of the pipe within the collar at the joints shall however, not be included in the length of pipe work.

Excavation, refilling, shorting and timbering in trenches masonry or concrete pillars and thrust blocks, wherever required, shall be measured separately, under relevant items of work.

RATE: The rate shall include the cost of materials and labor involved in all the operations described above.

2.1 **STONEWARE PIPES FOR DRAINAGES**

Salt-glazed Stoneware Pipes / Lead Glazed Stoneware Pipes

Stoneware pipes and Gully Traps shall be of first-class quality, Salt-glazed and free rough texture inside and outside ad straight. All pipes shall have the manufacturer's name marked on it and shall conform to I.S. 651/1971.

Alternatively, Salt-glazed pipes and fittings which conform to the following specifications may be used.

“The pipes and fittings shall be known as Best Commercial Quality and shall be manufactured of similar materials, and in a similar manner by similar process to those used in producing pipes and fittings in conformity with IS: 561/1955. Every pipe and fittings shall have legibly impressed upon it before fixing the pipes and fittings shall be examined and only those which are sound well glazed, free from visible defects which would impair the efficiency of the pipes or fittings, given a sharp clean note when struck with a light hammer and which are straight, shall be deemed to comply with this specifications”.

Laying of Stoneware Salt-glazed Pipes / Lead Glazed Stoneware Pipes

Pipes are liable to be damaged in transit and not withstanding tests which may have been made before dispatch, each pipe will be examined carefully on arrival at site. Each pipe shall be rung with a wooden hammer or mallet and those that do not ring true and clear, shall be rejected. Sound pipes shall be carefully stacked to prevent damage. All defective pipes should be segregated, marked in a conspicuous manner and their use in the works prevented and liable to remove from the site as and when ordered.

The pipes shall be laid with sockets leading uphill and should rest on solid and even foundations for the full length of the barrel. Socket holes shall be formed in the foundation sufficiently deep to allow the pipe jointer room to work right round the pipes and as short as practicable to admit the socket and allow the joint to be made.

Where pipes are not bedded on concrete the trench bottom shall be left slightly high and carefully bottomed up as pipe laying proceeds so that the pipe barrels rest on firm ground. If excavation has been carried too low, it shall be made up with cement concrete mix 1:4:8 at the contractor's expenses and charges.

If the bottom of the trench consists of rock or very hard ground that cannot be easily excavated to smooth surface the pipes shall be laid on concrete cradles to ensure even bearing. Nothing extra shall be paid on this account.

Each pipe shall be individually set for line and level by means of sight rails and boning rods as per standard practice.

JOINTING OF PIPES: Tarr'd Gasket shall first be wrapped round the spigot of each pipe and the spigot shall then be placed into the socket of the pipe previously laid, the pipe shall then be adjusted and fixed in its correct position and the gasket caulked tightly home so as to fill not more than one quarter of the total depth of the socket.

The remainder of the socket shall be filled with stiff mix of sand cement mortar filled; A fillet should be formed round the joint with a trowel forming an angle of 45 degrees with the barrel of the pipe.

The mortar shall be mixed as needed for immediate use and no mortar shall be beaten up and used after it has begun to set.

After the joint has been made any extraneous materials shall be removed from inside of the joint with a suitable scraper. The newly made joints shall be protected until set from the sun, drying winds, rain or dust. The joints shall be exposed and space left all-round the pipes for inspection by the Employer / Engineer. The inside of the

sewer must be left absolutely clear in bore and free cement mortar or other obstructions throughout its entire length. The joints shall be cured for at least for 24 days.

TESTING: All lengths of the sewer and drain shall be fully tested for water tightness by means of water pressure maintained for not less than 30 minutes. Testing shall be carried out from manhole to man hole. All pipes shall be subjected to a test pressure of at least two-meter head of water at the highest point of the section under test.

The pipes shall be plugged preferably with standard drain plugs (with rubber strings) on both ends. The upper end shall, however, be connected to a pipe for filling with water and getting the required bead.

DRAIN LINES SHALL BE TESTED FOR STRAIGHTNESS BY: Inserting a smooth ball of diameter 12 mm less than the bore of the pipe. In the absence of obstruction such as yarn or mortar projecting at the joints the ball should roll down the invert of the pipe and emerge at the lower end.

Means of a mirror at one end and a lamp at the other end. If the pipe line is straight the full circle of light will be seen otherwise obstruction or deviation will be apparent.

All man-holes shall be tested for water tightness by filling them with water and observing and water subsidence of level. The downstream pipe line shall be filled too with water to avoid the difficulty of removing the stopper from the outgo from the man-holes.

MEASUREMENT: For providing, laying and joining of stoneware pipes measurement shall be recorded for the finished length of the pipe line (including joints) i.e. from inside of one manhole to the inside of other manhole in running meters.

Length between gully traps and manholes shall be recorded between the socket of the pipe and inside of the manhole.

No extra payment is admissible for testing as described earlier.

- 2.2 **MANHOLES:** Manholes of different types and sizes shall be constructed in the Drain Line at such places and to such levels and dimensions as shown in the drawings or as directed by Architects / Consultants / Owner / Employer. The size specified shall indicate the inside dimensions of the manholes. The work shall be done strictly as per the drawings and specifications.

The manholes shall be executed true to dimensions and levels shown on the plan or as directed by Architects / Consultants / Owner / Employer. The excavation shall be done as directed.

Bed Concrete: The manholes shall be built on a bed of cement concrete (1:2:6) 1 Cement: 3 Coarse Sand : 6 Jhamma chips 40 mm size. The thickness of the bed shall be 100 mm unless otherwise specified or directed by Architects / Consultants / Owner / Employer.

Brick Work: The brick work shall be with 1st class bricks cement mortar 1:4 (1 cement: 4 coarse sand).

Plastering & Pointing: The walls of the manholes shall be plastered inside with 20 mm thick cement plaster 1:4) (1 cement: 4 coarse sand) finished with neat cement finished.

Where the saturated soil is met with also the external surface of the walls of the manhole shall be plastered with 12 mm thick cement plaster (1:4) finished smooth up to 30 cm above the highest sub-soil water level with the approval of "Architects / Consultants / Owner / Employer. The plastered area shall be water proofed with addition of approved water proofing compound as per manufacturer's recommendation.

Benching: The channels and benching shall be done in cement concrete 1:2:4 (1 cement: 2 coarse sand : 4 stone ballast 20 mm and rendered with neat cement finish.

R.C. C. Work: R.C.C. work for slabs shall be in cement concrete 1:2:4: (1 cement: 2 coarse sand : 4 stone ballast 20 mm). The thickness of the slab and reinforcement shall be as per standard drawings or as directed.

Foot Rests: All manholes deeper than (1.2 M) shall be provided with M.S. foot rests. Foot rests shall be 20 mm M.S. Square rods or 20 mm dia. M.S. round bars. They shall be embedded in cement concrete blocks 20 x 20 x 10 CMS of 1:3:6 mix.

Foot rest shall be fixed 30 CMS apart vertically and staggered laterally and shall project 10 CMS beyond the surface of the wall.

Foot rest shall be painted with 3 coats of anticorrosive bitumastic paint the portion embedded in the masonry or cement concrete block being painted with thick cement slurry before fixing.

Manhole Cover and Frames: Manhole Cover and Frames shall conform to I.S. 1726

The covers and frames shall be neatly cast and they shall be free from air and sand from cold shuts. They shall be neatly dressed and carefully trimmed. All castings shall be free from voids, whether due to shrinkage gas inclusion or other cause. Covers shall have raised chequered design on the top of it to provide an adequate non slip grip.

The covers shall be capable of easy opening and closing. It shall be fitted in frame in workman like manner. The cover shall be gas tight and water tight. The covers used in manholes in drainage line shall invariably bear the work "DRAIN" on the top and those used for storm water drains shall bear the word "STORM WATER DRAIN".

These marking shall be done during casting of the covers. The size of covers specified shall be taken as clear internal dimensions of the frame. The approximate weight of the various types of manhole covers and frames shall be as per able given below.

Description	Weight of Cover	Weight of Frame	Weight of Cover and frame
Medium duty 500 mm	58 Kgs	58 Kgs.	116 Kgs.

2 – ½% variation in weight shall be permissible

Covers and frames shall be firmly embedded to correct alignment and levels in R.C.C. slab in plain concrete as the case may be on the top of the masonry.

After completion of the work manhole covers shall be sealed by means of thick grease.

All manhole covers and frames should be painted both two coats of Acid Alkali proof paint both from inside and outside.

2.3 MODE OF MEASUREMENT: Unless otherwise stated, all pipes shall be measured net, length as laid or fixed and measured liner overall fittings, such as bends, junctions, etc. and given in running meters. The length shall be taken along the center line of the pipes and fittings.

Length of fittings viz; taps, valves, traps, etc. which are paid under appropriate item shall not be re-measured under linear measurements as enumerated above.

Soil, waste and vent pipes shall be measured along the center line of the stack including the connecting bends / tees to W.C. Pan, Nahani trap etc. and shall be paid as enumerated above.

W.C. pan, Lavatory basins, Sinks, drain board, Urinal, Mirrors, Glass Shelf, Toilet paper holder shall be measured by number and shall include all accessories as enumerated in detailed specifications under each item.

Unless otherwise specified, all types of taps, valves, etc. shall be measured by number and paid separately.

Manholes, Inspection Chambers, Gulley traps, etc. shall be constructed according to detailed specifications and measured by number and paid separately. The depth of man hole shall mean the vertical distance from the top of the manhole cover to the outgoing invert of the main drain channel.

LIST OF MATERIALS OF APPROVED BRAND AND MANUFACTURE

No	Item	Approved make
1	Plumbing Fittings	Jaquar/Parryware/Cera/Hindware/Johnson
2	Ci Pipes	Jaiswal/Gini/ equivalent
3	PVC/CPVC uPVC pipes	Supreme/Astral/Ashirwad/ Oriplast
4	Motor pumps	Kirloskar/Crompton/KBC, Willow
5	Foot valve/ Bal Valve	Leader /equivalent
6	PVC water tank	Sintex, Supreme/ Asirwad
7	GI Pipe	TATA/JINDAL/Prakash
8	SWR pipe	Locally available best quality
9	CAST iron Moanhole cover & frame	ISI approved
10	Mirror	As approved

Volume – III

TECHNICAL SPECIFICATIONS FOR ELECTRICAL WORKS (LT)

TECHNICAL SPECIFICATIONS FOR AUTOMATIC POWER FACTOR CORRECTION (APFC) PANEL BOARD FOR LOW VOLTAGE DISTRIBUTION NETWORKS

1.0 GENERAL

- I. This specification covers the general requirement of Design, Manufacture, Supply and Installation and Commissioning of Automatic Power Factor Correction equipment intended to be used with low voltage distribution networks.
- II. Power Correction equipment shall be able to improve the power factors as per regulations and shall be suitably rated to improve the system power factor such that power factor shall be near 1 i.e. Unity, based on the actual load and existing power factor.
- III. **Panel shall be fabricated/ manufactured by CPRI approved/ authorized/ certified fabricator/ manufacturer only confirming to International standards (IS) & in accordance to the Rules and regulations of IEC. The contractor has to take prior approval from the Bank after the completion of design part. The contractor shall provide CPRI tested certification for the LT panel board without fail.**
- IV. The power factor correction equipment shall normally be connected to the main LV Distribution Boards through dedicated feeders.
- V. This equipment's installed shall be stand alone with LV Distribution Board.
- VI. Power Factor Correction Equipment's would improve the power factor as per the local utility regulation. This equipment's shall be routine tested (CPRI approved testing) at Panel manufacturer's before dispatch.

2.0 APPLICABLE STANDARDS

Unless specified otherwise the capacitor banks shall conform in design, material, construction and performance to the latest editions of the IEC standards, their corresponding British European /(BS EN) standards and in particular to the following publications :

IEC 61921:	Power capacitors – Low voltage power factor correction banks.
IEC 60831-1 & 2: having a	Shunt power capacitors of the self-healing type for A.C. systems rated voltage up to and including 1000 V.
IEC 60076-6:	Power transformers - Part 6: Reactors
IEC 60085-1:	Electrical insulation – Thermal evaluation and designation.
IEC 60664:	Insulation coordination for equipment within low-voltage systems.
IEC 61439-1: eral	Low-Voltage Switchgear and Control gear Assemblies Part 1: General Rules
IEC 60947-1:	Low-voltage Switchgear and Control gear - Part 1: General Rules
IEC 60947-2:	Low-voltage Switchgear and Control gear - Part 2: Circuit Breakers.
IEC 60947-4-1:	Low-voltage Switchgear and Control gear – Part 4-1: Contactors and Motor-starters.
IEC 62208:	Empty enclosures for low-voltage switchgear and control gear assemblies – General requirements
IEC 60529:	Degree of protection provided enclosures (IP code)
IEC 62262:	Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)
IEC 61000-6-4:	Electromagnetic compatibility – Generic standards – Emission-standard for industrial environments
IEC 61000-6-2: 3	Generic standards – Immunity for industrial environments IEC 61000-3 Assessment of emission limits for the connection of distorting installations to MV, HV and EHV power systems.
IEEE 519-2014:	IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems.

In addition to the above listed standards, the Rules and Regulations for electrical installations issued by CEA regulation shall also be adhered to.

3.0 MARKING

The contractor shall arrange the following minimum information provided by the CPRI approved panel manufacturer/ fabricator in an instruction sheet and on a rating plate to be fixed on the assembly:

- 1) Manufacturer's name or trademark.
- 2) Serial number.
- 3) Date of manufacture
- 4) Rated reactive power, QN in kilovars (kVar).
- 5) Rated voltage, UN in volts (V).
- 6) Rated frequency, fN in hertz (Hz).
- 7) Minimum and maximum ambient temperatures in degrees Celsius (°C).
- 8) Degree of protection.
- 9) Short-circuit withstand strength, in amperes (A)
- 10) Number of stages
- 11) Step Size

4.0 CONSTRUCTION OF AUTOMATIC CAPACITOR BANK

- i. The enclosure housing the capacitor units shall be of minimum 1.5 mm thick electro galvanized sheet steel folded and welded construction, floor mounted, free standing or wall mounted type with a minimum degree of protection of IP54 complete with a hinged lockable door.
- ii. The enclosure system for capacitor bank shall be of certified design as per IEC 62208.
- iii. The enclosure system should have a minimum of IK 10 certification (external mechanical impacts) in accordance with IEC 62262.
- iv. All enclosures or partitions including locking means and hinges for doors shall be of a mechanical strength sufficient to withstand the stresses to which they may be subjected in normal service, and during short-circuit conditions.
- v. The enclosure will be wired at manufacturer/fabricator and comprise mainly of the following:
 - a) Power factor improvement 3 phase capacitors, arranged in a suitable number of stages.
 - b) Detuned three phase iron cored series reactors for harmonic current suppression.
 - c) Microprocessor based power factor regulator for automatic power factor correction.
 - d) 3 pole contactors for capacitor switching.
 - e) MCCB for each capacitor stage unless stated otherwise.
 - f) Main incomer isolating switch / MCCB.

- vi. The automatic capacitor bank should be ready for field connection with all the components clearly labeled for identification.
- vii. To ensure safety, reliability and accountability of component coordination, all the major capacitor bank components such as capacitor units, de-tuning reactors, PF controllers, Contactors called for in this specification should be preferably from a single source (manufacturer/ fabricator).
- viii. The Power Correction Equipment shall be installed in cool ventilated locations away from other heat radiating elements.
- ix. The Capacitor bank shall be designed for trouble free service under the arduous temperature conditions as defined in Regulations and typical of Indian Continental. The capacitor banks shall be operable on 50 Hz and shall meet or comply with IEC, IEC 61921 and IEC 61439-1.
- x. The Design and component selection shall consider continuous operation at a maximum system voltage of 415V and ensure reliable performance in consideration of room ambient temperature of 50 degree Centigrade.
- xi. All Components shall can withstand the dynamic, thermal and dielectric stresses resulting from prospective short circuit currents without damage or injury to personnel. Due to the presence of harmonic currents and to manufacturing tolerances, components (MCCB/ isolator, busbar & power cables) shall be designed for 1.5 times nominal current.
- xii. Ventilation fan and air inlet filter unit shall be provided for the capacitor banks to facilitate better heat dissipation. The ventilation fan shall be operated by two numbers of thermostat set at 35° and 55° Centigrade respectively.

Dimensional Details: Standard dimensions shall be ensured confirming to the IS and IEC standards mentioned above.

5.0 BUSBARS

- i. The bus bar section of power factor assemblies shall withstand, as a minimum, the fault current of the system at the point where it is intended to be connected. Usually, these assemblies are connected onto a section of the main installation where the fault current are quite high. Busbars shall be tin plated copper, rectangular and rigid construction.
- ii. The phase busbar shall be arranged systematically and assembled using insulators.
- iii. The busbars shall be protected with poly carbonate shrouds from all sides.
- iv. The busbar assembly shall be fully shrouded (at least IP20) so that no live parts are accessible. Phase identification (colour code) shall be done systematically.

- v. The rating of the main busbar assembly shall be to suit the incoming switching device rating. The main busbars of the capacitor banks are preferred and recommended to be in separate busbar chamber, wherever applicable.
- vi. Tin plated copper busbar and earth busbar shall be located on both sides of the incomer Busbars shall be provided with a suitable termination facility for connecting the main neutral and earth cable. Extra termination shall be provided on the earth bar for the bonding purpose.

6.0 TECHNICAL REQUIREMENTS

6.1 CAPACITOR UNITS:

Capacitor units shall be/of/have

1. Dry type
2. Suitable for a network voltage of 415 volts and shall be rated at minimum 525V for 14% detuned banks.
3. Suitable for continuous operation line current of 1.3 times the current which occurs at rated sinusoidal voltage and rated frequency excluding transients
4. Temperature category of the capacitor units shall be -5/D. Casings shall be metallic. Completely leakage proof.
5. Self-healing ability, where a damage of some part of the dielectric due to a microscopic flaw in the dielectric film, caused by over-voltage, can be self-healed quickly and returned to normal state.
6. A 3-phase pressure switch disconnecter for protection against internal faults, over pressure, etc. should be available. The pressure switch disconnecter must isolate all the three phases simultaneously in the event of fault. To ensure full functionality of the pressure switch disconnecter, its elastic elements must not be hindered, i.e.
 - a. Connecting lines must be flexible leads.
 - b. There must be sufficient space for expansion above the connections
7. The built-in discharge resistors shall not be accessible (fitted at CPRI approved manufacturer/ fabricator) and tamper proof. The discharge resistors shall ensure reduction in capacitor voltage to less than 50 volts in 1 minute after switch off.
8. The total losses including discharge resistors to be less than 0.5 Watt/KVAR. Capacitance tolerance shall be within +/- 5% of the rated value.
9. The Capacitor unit shall be capable of withstanding the inrush current up to 200 times of its rated current.
10. The rated output of the capacitor Unit has to be at the supply voltage of 415V and 50 Hz frequency. The capacitors used in conjunction with reactors shall be suitably de-rated to deliver the designed output at 415V.

6.2 DE-TUNING REACTORS:

1. Capacitors with detuned filtering technique shall be employed to correct power factor while avoiding the risk of resonance condition. This shall be performed by shifting the resonance frequency to lower values where no harmonic currents are present, by introducing a filter reactor in series with the capacitors, such that the capacitor / reactor combination is inductive at the dangerous frequencies but capacitive at fundamental frequency. The circuit should be tuned such that the series resonant frequency should be below the lowest harmonic order expected to be present in the electrical network.
2. The de-tuning reactors shall be connected in series with each capacitor stage and shall be of iron cored type.
3. The Detuned Reactor Should be equipped with Thermal Switch inside the Winding which should cut-off the respective contactor in case of Over-temperature.
4. The capacitors used in conjunction with reactors shall be suitably de-rated to deliver the designed output at 415V.
5. The reactor insulation shall be Class "F" or above. The maximum temperature of the reactor at maximum continuous RMS amperage shall be no higher than 145°C at a 50°C ambient. The capacitor and reactors shall be tuned for 135 Hz and 14% relative impedance (2.7 tuning order) for 3rd Harmonics present in the network.
6. Tolerance of reactors shall not exceed +/-3% of rated value.

6.3 POWER FACTOR CONTROLLERS:

The power factor controller shall/ be able to:

1. Microprocessor based and shall be able to sense the reactive current requirement of the network and shall switch ON / OFF the required stages of a capacitor bank.
2. Insensitive to wirings such as reversed CT connection, PT on a wrong phase etc.
3. Detect any stage size by automatic recognition and the switching sequences should be user defined. Detect the capacitor bank size if in case the present capacitor is replaced by a new capacitor of different rating is equipped with LCD display which shows at any time power factor, internal capacitor bank temperature and monitors the line frequency. Suitable for 1A or 5 A current input and operating in temperatures up to +50 degrees C.
4. The capacitor Bank and controller shall ensure that after the loss by fault of any

- one stage, it shall continue to operate automatically and shall follow rotational switching.
5. Recognize the connection of CT and Voltage and be able to automatically adjust itself to the phase angle difference. Regulator shall have capability to automatically search and set the C/K setting, it shall be also possible to program the C/K setting manually.
 6. Have a minimum time delay of 120 seconds for switching on a capacitor into circuit, from its last disconnection from the circuit.
 7. The ingress protection of the regulator shall be minimum IP 40.
 8. The regulator must be panel mounted, shall be easily programmable and shall conform to safety guidelines as per IEC 61010-1:2001
 9. The regulator must be suitable for 1 A or 5 A current input and shall be sensitive to a minimum current input of 40mA. The threshold value for the operating temperature and system harmonics shall be programmable and the regulator shall be able to switch off the connected capacitor stages if the actual values exceed the thresholds.
 10. Be equipped with RS 485 communication port.
 11. Dual Cos Phi – The Controller should have programmable dual cos phi to differentiate the need in compensation (Cos Phi) when the operating condition changes. Like Peak Hour (2:30- 3:30PM when the target PF could be increased to 0.98) or Power factor correction needs with a utility supply changes when the input power is from an in house Generator.
 12. The Power factor controller/regulator should allow the following readings.
 - a) Automatic initialization and stage rating detection
 - b) Any step sequence detection (User definable step sequence)
 - c) Measurement of capacitance per stage
 - d) Cap bank over load current ratio
 - e) THD Voltage
 - f) 4 Quadrant operation
 - g) Active , reactive and apparent power
 - h) Record of the Max temp internal of the capacitor bank since reset
 - i) System Voltage (V AC)
 - j) Frequency
 - k) Apparent Power (kVA)
 - l) Apparent current (A)
 - m) Temperature (°C)
 - n) Real time Cos phi
 - o) kVA_r value to target Cos phi

13. **The controller shall initiate alarms and warnings in the following events.**

- a) Temperature limit is exceeded
- b) Insufficient capacitor output
- c) Overload current ratio limit is exceeded
- d) Under voltage, Over voltage
- e) THDU limit is exceeded
- f) Low power factor/ under compensation.
- g) Over compensation
- h) Over current
- i) Capacitor step defective

6.4 SHORT CIRCUIT AND OVER LOAD PROTECTION:

1. The capacitor bank shall be protected by a suitably rated MCCB/Isolator at the incomer. It shall have a rotary front operating door mounted handle and should be interlocked with the door to ensure that the capacitor bank is de-energized when door is open.
2. The MCCB/Isolator shall be a three pole and shall fully comply with the requirements of the IEC 60947-1 & 2. The MCCB shall be rated for a minimum insulation voltage of 660 V and designed for an ambient temperature of 50 degrees C.
3. The current rating shall be at least 1.5 times the full load current of the capacitor bank and shall have a better mechanical endurance. Each stage of the capacitor bank shall also have a suitably rated MCCB with an electronic over-current relay for overload protection. The electronic over-current relay shall be adjusted to trip if the RMS current of the stage exceeds the overload setting.
4. The combination of bus bars and stage breakers shall be designed for a short circuit withstand of 50kA/1sec minimum.

6.5 CONTACTORS (STAGE SWITCHING):

1. Depending on the requirements either electromagnetic contactors or electronically controlled (using durable and reliable electronic switch) contactor shall be used for switching PFC capacitors. For transient free switching, suitable and durable electrical/ electronic switches viz. **capacity duty contactors** shall be employed.

6.5.1 ELECTROMAGNETIC CONTACTOR:

1. The contactors shall be of type three poles, specially designed for switching capacitors and shall be able to make against large transient current peaks at a high frequency of several kHz that can occur on capacitor switching.
2. The contactors shall isolate all the three supply phases to the capacitor on switch

off. Contactors along with damping resistors (AC6b) shall be used where there is a possibility of high inrush peak current to reduce it.

3. The capacitor contactors shall be weld resistant up to a possible peak inrush current of $200 * IR$.
4. In case capacitor banks are supplied with Harmonic Blocking Reactors, contactors for capacitor switching shall be without damping resistors (AC3), because the peak current limitation is provided by Reactor impedance.

6.6 ENCLOSURE SYSTEM:

1. The enclosure system for capacitor bank shall be confirming to above mentioned IS and IEC and to be manufactured/ fabricated by the CPRI approved manufacturer/ fabricator.
2. The degree of protection of enclosures system shall be in accordance with IEC 60529.
3. The enclosure system should have a certification for steady-state sinusoidal vibration in accordance with standard IEC 60068-2-6.
4. Components such as capacitor units, series reactors, power factor controller, electro-magnetic / thyristor switched contactors, switch-disconnector, MCCBs etc. shall be housed in this enclosure. The capacitor bank shall be free-standing type and the doors must incorporate 3- point locking system.
5. The enclosure door shall be interlocked with the incomer MCCB / switch-disconnector. Doors shall not be provided on the sides / rear of the capacitor bank.

7.0 TESTING AND INSPECTION

7.1. ROUTINE TESTS:

1. All tests shall be carried out in the presence of engineer in charge, at such times as he may reasonably require.
2. All samples used for testing shall be to the contractor's expense and shall not affect the quantities to be supplied under this contract.
3. All instrument used for testing purposes, shall be calibrated by an approved/ competent authority.
4. The cost of all tests shall be included in the contract price and shall not be quoted separately.

a) Routine Tests on Capacitor Bank

- Routine tests shall be carried out on every Low voltage power factor correction banks before delivery at site.
 - Inspection of the assembly including inspection of wiring and, if necessary, an electrical operation test
 - Dielectric test
 - Checking of protective measures and of the electrical continuity of the protective circuit
 - Verification of insulation resistance

b) Routine Tests on Capacitor Units

Routine tests shall be carried out on every capacitor unit before delivery at site. Capacitor Banks should accompany the test reports of the Capacitor Units used issued by the manufacturer/supplier.

- Capacitance measurement and output calculation
- Voltage test between terminals
- Voltage test between terminals and container
- Test of the internal discharge device
- Sealing test

7.2. SITE TESTS:

1. The contractor is responsible for submitting all contract works to site inspection by the Engineer/Architect, before site tests are commenced. Before commissioning, the contractor shall depute an experienced and qualified testing Engineer from the manufacturer's works to carry out the following tests on the equipment and such other tests that may be considered necessary by the Purchaser.
2. The Site Acceptance Test (SAT) format for the capacitor bank shall be forwarded to the purchaser prior to the SAT.
3. The contractor's test engineer shall complete all pre-commissioning tests, commission all plant and equipment supplied by him and hand over the entire contract works to the Purchaser in good shape. All the charges connected with the pre-commissioning tests of the equipment shall be included in the tender price.
4. The contractor's testing engineer shall carry out all commissioning tests in cooperation with and to the satisfaction of the Purchaser's engineer who will take part in all these tests.

5. The contractor shall arrange all test equipment required for different test purposes at site. The following test / inspections at site shall be carried out:

7.2.1. Mechanical Tests:

1. Visual inspection to verify degree of protection, creepage and clearance distances.
2. All conductors and cables are checked for proper routing and all devices for proper mounting.
3. Check effectiveness of all mechanical devices, e.g. handles, locks, interlocks, operating devices, etc. Check panel conformity to drawing and Engineer's requirements.
 - a) Checking of all mounting plates/fasteners.
 - b) Checking of dimensions and components as per drawings.
 - c) Electrical circuits fasteners tightness/ surface area contacts.
 - d) Crimping and ferrules as per drawing.
 - e) Labels / Identification/ Nameplate.
 - f) All doors checking, safety and accessibility.
 - g) APFC cabinet surface finish / smoothness.

7.3.2 Electrical Tests:

1. Insulation resistance test shall be carried out at all main circuits through to final terminals. Insulation resistance shall exceed 10 mega ohms. Record all measurements.
2. Function test of all circuit breakers switches, contacts, etc. and every circuit to verify correct operation.
 - a) Insulations resistance tests between phases and earth and between neutral and earth.
 - b) Operational test on components.
 - c) Switching ON / Off of capacitor bank on various kVAR requirement.
 - d) Checking of Display parameters.
 - e) Switching On / Off logic verification.
 - f) Data communication through Serial / optical port
 - g) Verification of data/reports/functions in base computer software.

7.3.3 Final Inspection

Prior to energizing the capacitor bank the following checks shall be carried out at site:

1. Operate the equipment through all design functions, including remote operation, actuation of alarm and indicating devices, mechanical and electrical tripping and closing and operation of the protective devices.

2. Insulation resistance measurements on the buses, phase to phase and phase to ground, with all breakers in the fully connected position and contacts open.
3. Control circuit insulation resistance to ground.
4. Inspect all relays and protective devices, and verify settings in accordance with the manufacturer's instructions. Inspect current transformers and relays for correct polarity of connections and the installation of jumpers on unused current transformer circuits.
5. Manually close and trip each breaker checking and adjusting the main contact alignment and wiring action in accordance with the manufacturer's instructions.
6. Test protective relay operation for incomer air circuit breakers.

With the capacitor bank in operation, measurement of the power factor and system harmonics shall be carried out after commissioning of equipment.

8.0 DRAWINGS AND INFORMATION

The contractor shall furnish the following drawings and documents placed inside the drawing pocket of the equipment supplied:

- Dimensioned drawing showing outline of the capacitor bank
- Single line diagram showing all the major electrical components.
- Protection and control schematics of the capacitor bank
- Details of cable terminations and fittings.
- Technical Manual giving installation, operation and maintenance instructions

9.0 GROUNDING

- All bank and enclosure shall be connected to a 40mm x 6mm earth copper bus bar.

10.0 HANDLING

1. The equipment shall be provided with lifting rings, or provided with provision for using a fork lift truck for handling.
2. For installation, a 250 mm space shall be provided from the front of the bank, in order to have an optimal position of the bank for good ventilation.

11.0 Warranty

The equipment will be guaranteed on our workmanship for a period of 12 months from the date of commissioning or 18 months from the date of dispatch whichever is earlier.

12.0 GENERAL PARTICULARS AND GUARANTEES**CAPACITOR BANKS**

- 1) Manufacturer & Country of Manufacture.
- 2) Type and reference
- 3) Supply Voltage V
- 4) Highest System voltage V
- 5) Rated Frequency Hz
- 6) Rated Capacity of Complete Bank
- 7) Number and Capacity of each stage.
- 8) Connection configuration
- 9) Method of control
- 10) Electrical Clearances
 - a. Phase to phase
 - b. Phase to earth

CAPACITOR UNIT

- 1) Manufacturer/Country of Manufacture
- 2) Type reference
- 3) Standards Applicable
- 4) Rated Power kvar
- 5) Rated Voltage V
- 6) Rated Current A
- 7) Rated Frequency Hz
- 8) Rated Capacitance Mf
- 9) No.of Elements(Capacitors)
 - a) In Series
 - b) In parallel

- 10) Continuous Over voltage withstand capability %
- 11) Maximum permissible Overload current %
- 12) Capacitor loss at rated Voltage W
- 13) Type of active element
- 14) Built in Discharge device resistance
- 15) Discharging time to achieve 50V
- 16) Service indoor/outdoor
- 17)

POWER FACTOR CONTROLLER

- 1) Manufacturer/Country of Manufacture
- 2) Type
- 3) Rated Current
- 4) Supply Voltage
- 5) Measuring Accuracy
- 6) Regulation steps
- 7) Setting range
- 8) Over compensation monitoring Yes/No
- 9) Manual Mode Yes/No
- 10) Degree of Protection
- 11) Communications
- 12) Operating conditions Temp, Humidity

DE TUNING REACTORS

- 1) Tuning frequency
- 2) Detuning Factor
- 3) Inductance
- 4) Nominal Voltage
- 5) Insulation Temperature class

ENCLOSURE

- 1) Type
- 2) Degree of Protection
- 3) Sheet Thickness
- 4) Painting thickness
- 5) Mechanical Protection
- 6) Compartments
- 7) Cooling arrangements and louvers
- 8) Dimensional details

TECHNICAL SPECIFICATIONS FOR INDOOR L.T. DISTRIBUTION PANEL BOARD

1. Main LT Distribution Panel Board shall be covered under this section. Panels/Boards shall be suitable for operation on 3 Phase/single phase, 415/240 Volts, 50 cycles, 4 wire system with neutral grounded at transformer. All switchgears shall be fully rated at an ambient of 40 Degree C.
2. The scope of supply covers design, supply, installation, testing and commissioning of L V PCC Panel. **Panel shall be fabricated/ manufactured by CPRI approved/ authorized/ certified fabricator/ manufacturer only. The contractor has to take prior approval from the Bank after the completion of design part. The contractor shall provide CPRI tested certification for the LT panel board without fail.**
3. The equipment covered under this specification shall conform to the latest revisions of relevant Indian and International Standards some of which are listed below.

IS 13947 1993	:	General requirements of Switchgear and Control Gear for Voltage not Exceeding 1000 / 1200V AC
IS 11353 1985	:	Guide for uniform system of marking Identification of Busbar and Terminals.
IS 13703 1993	:	Low voltage fuses
IS 2705 1992	:	Current transformers
IS 694 1990	:	PVC insulated cables for voltages including 1100 V with Copper and Aluminum conductor)
IS 1248 1983	:	Direct Acting Electrical Indicating Analog
IS 8623 1993	:	Low voltage Switch gear & control gear assemblies
IS 5082	:	Electrolytic Aluminum Busbar, Trunking system, Rod tubes & sections for Electrical purposes.
IS 13779 1999	:	AC Electric Meters / Static Meters.

1.1 Construction Features

1. The panel board shall be metal clad sheet steel enclosed cubicle, fully compartmentalized, floor mounting type suitable for indoor installations and extensible type.
2. The panel board shall be metal clad sheet steel enclosed cubicle, fully compartmentalized, floor mounting type suitable for indoor installations. All the doors and covers shall be fully gasket to prevent any ingress of dust. The enclosure shall be for Indoor type and completely dust, damp and vermin proof. Gasket used for all doors shall be of double lip type.
3. The switchboard cubicles shall have structural steel frame work enclosed on all sides and top by CRCA sheet steel of minimum thickness.

4. The panel board shall have integral base frame.
5. Removable undrilled gland plates shall be fitted for bottom cable entry.
6. All fixing bolts, screws etc. appearing on the panel shall be so arranged as to present a neat appearance.
7. Door hinges shall be concealed type.
8. Front access shall be available to all components in each cubicle which require adjustment, maintenance or replacement.
9. Unless otherwise approved, incomer and bus section panels or sections shall be separate and independent and shall not be mixed with sections required for feeders.
10. Overall height of the panel shall not exceed 2.4 meters. Operating levers, handle etc. of highest unit shall not be higher than 1.7 meters.
11. Distribution panels shall be of adequate size as indicated in layouts with a provision of spare switchgear as indicated on the Single Line Diagram. Feeders shall be arranged in multi-tier. Knockout holes of appropriate size and number shall be provided in the Distribution panels in conformity with the location of cable/conduit connections. Removable sheet steel plates shall be provided at the top/Bottom to make holes for additional cable entry at site if required.
12. Every cabinet shall be provided with Trifoliate or engraved metal name plates. Panel board shall be provided with single line circuit diagram showing the arrangement of circuit inside the distribution board shall be pasted inside of the panel door and covered with transparent laminated plastic sheet. All live accessible connections shall be shrouded and shall be finger touch proof and minimum clearance between phase and earth shall be 20 mm and phase to phase shall be 25 mm.

1.2 Bus Bar & insulating materials

1. The busbars connections and bus taps to individual feeders shall be by means of electrolyte copper bus bar. Busbars shall be colour coded for ready identification of phases. The Busbar sizes shall be determined taking into consideration the continuous rating and fault level of 50 KA (1 sec) without exceeding the final temperature of 105 degree C under rated current.
2. Auxiliary busbars each of minimum 25 sq. mm thick electrolytic tough pitch copper shall be provided for following applications. Exact number of busbars shall depend on various controls, metering and auxiliary power distribution requirements.
3. All the Phases and Neutral Busbar shall be provided in the same compartment for main power as well as for DG power.
4. The busbars shall be supported of regular intervals using SMC or DMC insulators It

should have Very high Comparative Tracking Index (CTI > 600 as per IS 2824). Only zinc passivated high tensile strength steel bolts, nuts & washers etc. shall be used for all bus-bar joints & supports.

5. The busbars shall be colour coded using identifying colour rings at regular interval. Red, Yellow & Blue colour shall be used for phases & Black for neutral. The earth Busbar shall be identified with Green colour rings at regular intervals. Minimum clearance between phases / live parts shall be 25 mm and phases / live parts / neutral to ground shall be 19 mm except on the equipment terminals.
6. Spare contacts shall be wired up to terminal block. Auxiliary contacts in the „trip“ circuit shall close before the breaker main contacts close and shall open after the main contacts have opened. All other contacts shall operate simultaneously with the main contacts.

1.3 Small Wiring

All small wiring for Controls, Indication etc. shall be of FRLS (Flame retardant Low Smoke) copper conductor cables. Minimum size of conductor for power circuits shall be 2.5 sq. mm copper or 6 sq. mm aluminum. All control wiring except CT secondary wiring shall be carried out with minimum 1.5 sq. mm copper conductor. CT secondary wiring shall be carried out with 2.5 sq. mm copper conductor. All wiring shall be securely fixed and neatly arranged to enable easy tracing of wires. All terminal blocks and wires shall be tagged/ Ferruled at both the ends for identification in accordance with IS 11353. All wiring for external connections shall be brought out to the individual terminals on a readily accessible Terminal block; all terminal block shall be shrouded or provided with transparent covers. Clamp type control terminal blocks shall be provided for outgoing control cables. Minimum 10% spare terminals shall be provided for future use. **Control terminal block shall be separated from power terminal blocks by means of an insulating barrier**

1.4 Earthing

- i. Earthing - Two earth terminals shall be provided on each side of switchboard. An earth bar size must be at least 50 x 10 mm Aluminium suitable for 30kA for 1 sec. shall be provided. The earth bar shall be electrically continuous and shall run the full extent of each board. This earth bar shall be on the same side as the cable entry. Each unit shall be constructed to ensure satisfactory electrical continuity between all metal parts not intended to be alive and earth terminals of the unit. Suitable holes with bolts and nuts shall be provided at each end of earth bar of switchgear for connection to a main Earthing grid. The earth bar shall be accessible in each cable entering compartment either directly or through a branch extension to ground the cable armour and shields. 10 mm Ø holes shall be drilled and hardware for connection provided through the earth bus.
- ii. Door earthing shall be provided for all the compartment.
- iii. The armour shall be properly connected with earthing clamp and the clamp shall be ultimately bonded with the earth bar.

1.5 Cable Terminations and Marshalling Box

Cable entry to switchgear shall be from top/bottom of the switchgear or as specified in the technical particulars. Ample space shall be provided in the cable compartment to accommodate XLPE insulated aluminum conductor cable as specified in the technical particulars.

Removable undrilled gland plate shall be provided for termination of Cables

1.6 Painting and Finishing

All metal works and metal parts of the panel boards shall undergo a process of degreasing, pickling in acid, cold rinsing, phosphatizing, passivating and then sprayed with double coated a high corrosion resistant primer shall be applied before painting.

The finishing treatment shall be by application of 2-coat of **RAL 7032**.

1.7 Name Plates & Label

A separate name plate mentioning designation of the feeder/panel board shall be affixed prominently on the front top. Details of designation shall be specified. Labels giving following details shall be affixed on each feeder panel

- 1.7.1 Feeder No - As per feeder list
- 1.7.2 Equipment tag Number and Description
- 1.7.3 Rating (kW/kVA/Amp)

A name plate with the panel's designation in bold letters shall be fixed at top of the central panel. A separate name plate giving feeder details shall be provided for each feeder module door.

Inside the feeder compartments, the electrical components, equipment, accessories like switchgear, control gear, lamps, relays etc. shall suitably be identified by providing stickers.

All components whether mounted inside the switchboard or on the door shall be permanently and clearly labeled with reference number and/or letter of their function. Labels for feeder panel designation shall be fixed on the front side of respective panels shall be engraved name plates preferably of 3 ply (Red-White-Red or Black-White-Black) lamicol sheet. However, black engraved Perspex sheet name plates shall also be acceptable. Engraving shall be done with square groove cutters.

1.8 Testing and Inspection

The following tests shall be carried out by the contractor:

- 1.8.1 All routine tests specified in relevant Indian Standards and witnessed by buyer.
- 1.8.2 Vendor shall submit all following test report as per the latest IS & IEC Standards:
 - 1.8.2.1 Short Circuit withstand test for main Busbar and neutral Busbar

1.8.2.2 Temperature rise test

1.8.2.3 IP test

1.8.3 Operation of all meters.

1.8.4 Secondary wiring continuity test with a low voltage (6 volts) tester.

1.8.5 Insulation test with 1000 volts megger, before and after H. V. test.

1.8.6 H. V. test at 2.5 kV for 1 mtr.

1.8.7 Earth continuity test with a low voltage (6 volts) tester.

1.8.8 Simulating control circuits for various operations of feeders

1.8.9 C. T. Polarity Test.

1.9 Technical Requirements - PCC

General Requirements

Service	:	Indoor
Enclosure	:	CRCA sheet steel
Min Degree of Protection	:	IP 54
Execution	:	Double front
Incomer MCCB	:	Thermal magnetic
Outgoing MCCB	:	Thermal magnetic
Extensibility	:	Extensible on both sides

Enclosure

Sheet steel thickness (mm)	:	Base frame/channel – 2.5 mm Front door & Load Bearing member – 2 mm Internal partitions – 1.6 mm
Surface treatment	:	7 Tank surface treatment.
Painting	:	Epoxy painted.
Paint shade	:	Light Grey

Main Busbar

Material	:	Electrical grade Cop- per
Rated continuous current	:	As per TTA design certification
Maximum operating Rated short time current (kA- RMS)	:	21 kA sym for 1
Heat shrinkable sleeving	:	Yes with Shrouds for
Joints Current rating of busbar droppers	:	As per requirement in vertical section
Busbar support	:	SMC/DMC

Earth Bus

Material (min.)	:	Aluminium 50 x 10 Sq.mm size
Short circuit capacity (KA)	:	36kA current for 1 Sec.

1.10 Moulded Case Circuit Breaker (MCCB)

1. The MCCB should be current limiting type with trip time of less than 10 ms under short circuit conditions. The MCCB should be either 3 or 4 poles as specified in BOQ. MCCB shall comply with the requirements of the relevant standards IS13947 – Part 2/IEC 60947-1&2 and should have test certificates for Breaking capacities from independent test authorities CPRI/ ERDA or any accredited international lab.
2. The MCCB shall be rated at operational voltage of 415V, 50/60Hz supply system, and 40oC ambient temperature. In case of deration due to operating temperature the same should be indicated and should be done in line with the required ratings of MCCB
3. MCCBs shall be available in fixed or plug-in/withdrawable versions as well as in 3-pole and 4-pole versions. For plug-in/withdrawable versions, a safety trip shall provide advanced opening to prevent connection and disconnection of a closed circuit breaker.
4. MCCBs shall be designed for both vertical and horizontal mounting, without any adverse effect on electrical performance. It shall be possible to supply power either from the upstream or downstream side.

5. MCCB shall comprise of Quick Make -break switching mechanism, arc extinguishing device and the tripping unit shall be contained in a compact, high strength, heat resistant, flame retardant, insulating moulded case with high withstand capability against thermal and mechanical stresses
6. Beyond 300Amps capacity MCCBs shall have positive isolation and preferably double break / contact repulsion & double insulation features.
7. The breaking capacity of MCCB shall be as specified in the schedule of quantities. The rated service breaking capacity (Ics) should be equal to rated ultimate breaking capacities (Icu).MCCBs for motor application should be selected in line with Type-2 Co-ordination as per IEC-60947-2, 1989/IS 13947-2. The breaker as supplied with ROM should meet IP54 degree of protection.

a) Current Limiting & Coordination

The MCCB shall employ maintenance free minimum let-through energies and capable of achieving discrimination up to the full short circuit capacity of the downstream MCCB.

Protection Functions:

1. MCCBs with ratings up to and including 630 A shall be equipped with thermal magnetic trip units in order to ensure the protection against overload and short-circuit.
2. Electronic and thermal-magnetic trip units shall be adjustable and it shall be possible to fit lead seals to prevent unauthorized access to the settings
3. MCCBs, the current ratings of which are identical with the ratings of their trip units, shall ensure discrimination for any fault current up to at least 50 kA rms
4. Protection settings shall apply to all circuit breaker poles.
5. Thermal-magnetic trip units (up to and including 630 A) shall have adjustable thermal protection from 0.8 to 1.0 times the current rating , Adjustable magnetic protection for current setting values from 10 to 15 times of rated current. It shall be possible to ensure neutral protection. The tripping threshold shall be equal to that of the phases or to a reduced value (generally half of that of the phases). Thermal magnetic MCCBs shall be provided with identification facility for short circuit fault.
6. In the event of repeated overloads, the electronic trip unit shall optimize protection of cables and downstream devices by memorizing temperature variations.
7. Thermal-magnetic trip units shall be adjustable and it shall be possible to fit lead seals to prevent unauthorized access to the settings
8. Protection settings shall apply to all poles of circuit breaker.

Additional details for individual accessories

a) Internal Accessories

Functions: 3 different types of auxiliaries shall be available:

1. Auxiliary Switch
2. Signaling Switch

3. Lading contact
4. Shunt Trip - continuous rated, with wide band site selectable voltage (24-48V AC/DC or 110V DC or 230-500V AC or 230V DC)
5. Under voltage Release- continuous rated, with wide band site selectable voltage (24-48V AC/DC or 110V DC or 230-500V AC or 230V DC)
6. Mounting electrical auxiliaries should not affect the performance of the breaker.
7. Each auxiliary shall be provided with a proper packaging and instruction notice.

b) Mounting and IP

1. The electrical auxiliaries shall be field installable.
2. Electrical auxiliaries shall be easily and rapidly snapped inside the breaker without any tool, behind the auxiliary cover.
3. Lead-wires shall not affect the mounting of the breakers side by side.
4. When auxiliary cover is opened:
 - a) Auxiliaries are held in place by themselves,
 - b) When auxiliaries are mounted, protection against electric shock must be IP20 or IP30.

c) External accessories

1. Mounting accessory on the breaker shall not affect its performances.
2. Accessories shall be field installable.
3. Each accessory shall be provided with a proper packaging and instruction notice.

d) Phase barriers

Phase barriers shall be mounted without any tool and hold in place firmly. They Mounted between phases of a breaker and between breakers mounted side by side. The phase barriers shall be made of an isolating material and should be flexible.

e) Terminal shields

Terminal shields shall be mounted without any tool and hold in place firmly. They shall be made of an isolating material. There shall no requirement of special tool to replace the terminal covers.

f) Direct rotary handle

Standard:

The rotary handle mounted on the breaker shall meet the IEC60947-2 requirements and will not affect the performance of the breaker. The rotary handle shall meet IEC60447. When the breaker is mounted with a rotary handle, the isolation function remains and fulfills IEC60947-2.

Installation:

The direct rotary handle shall be mounted easily and rapidly on the breaker on site without removing any part of the breaker or external accessories. The rotary handle shall be mounted easily on 2, 3 and 4 pole breakers.

Operation:

The rotary handle shall indicate the position of the breaker: OFF, TRIPPED or ON. Door should have a door defeat facility to open when the circuit breaker is ON in case of emergency. The door cannot be open if the breaker is ON.

g) Extended rotary handle**Standard:**

The rotary handle mounted on the breaker shall meet the IEC60947-2 requirements and will not affect the performance of the breaker. The rotary handle shall meet IEC60447. When the breaker is mounted with a rotary handle, the isolation function remains and fulfils IEC60947-2.

Installation:

The mounting of the rotary handle should be done without removing the breaker if mounted on its back plate. The rotary handle shall be mounted easily on 3 and 4 pole breakers. The rotary handle shall have pad locking facility in OFF position to take care of the lock outs. The rotary handle shall also provide door defeat facility to open the door for emergency requirement in ON position.

Operation:

The rotary handle shall indicate the position of the breaker: OFF, TRIPPED or ON.

h) Plug-in mounting Standard

When the breaker is mounted on a plug-in, the system remains and fulfils IEC60947-2.

Installation

- I. The device shall include the complete accessories for assembling the circuit breaker in plug-in design. Interlocking connecting rod shall be provided ensuring automatic switching off the circuit breaker for handling, inserting & removal.
- II. The plug in device and circuit breaker shall be provided with a keying set, which prevents inserting any other circuit breaker into the plug-in device.
- III. The plug-in device shall be provided with position signaling switch

i) Mechanical interlocking

The mechanical interlocking facility shall have front mounting mechanical interlocking and parallel switching

j) Testing

- I. Original test certificate of the MCCB as per IEC 60947-1 & 2 or IS13947 shall be furnished.
- II. Pre-commissioning tests on the panel board panel incorporating the MCCB shall be done as per standard specifications.

1.11 Multifunction meters

a) Multifunction Meters (For Incomer MCCB Feeders)

The meters shall conform to IEC 61557-12, IEC 62053-22, and IEC 62053-23 standards
General Requirements

1. The meter shall be suitable for operation in single - or multi- phase networks, balanced as well as unbalanced load
2. It shall be possible to use the multifunction meter directly in 440V networks
3. The current inputs shall be configurable at site for measuring on x/1 A or x/5 A current transformers
4. The multifunction meters shall be suitable for operation up to 55 Deg C
5. The meters shall be suitable for operation with AC auxiliary power and shall have wide tolerance band of 95V to 240 V ($\pm 10\%$)
6. The multifunction meters shall have high degree of protection (IP65 from the front) against ingress of dust & water
7. The multifunction meters shall have backlit LCD display with adjustable contrast
8. The meter shall be tamper-proof (password protected) to avoid mishandling by unauthorized person
9. The entire multifunction meter should be IP based and can be hooked up to existing Intranet.

b) Technical Requirements

1. All meters should be with accuracy class 0.2 at least.
2. Meters must have an Ethernet port onboard for communication over Modbus TCP/IP protocol.
3. All Gateways or converters shall be avoided for sending the data to SCADA Server.
4. All basic electrical parameters (Current, Voltage, Power, Frequency, Power factor) should be available on display as well for communication with EMS software.
5. All Meters should have inbuilt and / or expandable Digital input, output for reading the breaker status (Trip / ON / OFF) on inputs and remote ON/OFF of breakers.

6. Power Monitoring Device must have Battery back up to save data in inbuilt memory (i.e. DailyEnergy Counters and Event log reports) which can be retrievable in excel Format
7. Digital inputs shall be self wet or by external 24V DC / AC safety extra low voltage power supply.
8. Digital outputs shall be able to drive contactor or a relay contact. Also outputs shall be usable with limit or Boolean logic of multiple limits overflow or underflow and limit function shall be parametrical for value, parameter, underflow or overflow and hysteresis.
9. All meters shall have possibility of remote parameterization & monitoring using the software apart from front fascia programming using soft keys
10. All metered values will be in "true RMS" values. The monitor shall include a keypad allowing for the viewing of different selected values. The monitor shall display the following values:

Voltages	Phase-phase / phase-neutral
Currents	Per phase
Apparent, active and reactive power	Per phase and total
Power factor	Per phase and total
Frequency	48...52 Hz
THD for voltage and current	Per phase
Min. / max. values	Voltage - phase-phase, phase-neutral, Current / Power / Power factor / THD per phase, Frequency, Three phase average voltage and current
Average values	Voltage - phase-phase, phase-neutral Voltage min. / max. : for phase-phase, phase-neutral
Active energy	Current: Current min. / max. Import / export; high / low tariff
Reactive energy	Positive / negative; high / low tariff
Apparent energy	High / low tariff

Energy demand per measuring period	Three phase average rating for active and reactive power: 1 to 60 min.
Min. / max. rating values within the measuring period	Should be possible to be measured
Meter running counter	Uptime in hours
Universal counter	Pulse counting of external devices like water, gas, etc.

c) Multifunction Meters (For Outgoing MCCB Feeders)

The meters shall conform in all respects to International standards – IEC 61557-12, IEC 62053-22, IEC 62053-23 or the relevant Indian standards with latest amendments thereof.

General Requirements

- The meter shall be suitable for operation in 3 - phase networks, balanced as well as unbalanced load**
- It shall be possible to use the multifunction meter directly in 440V networks
- The current inputs shall be configurable at site for measuring x/5 A current transformers
- The multifunction meters shall be suitable for operation up to 55 Deg C
- The meters shall be suitable for operation with AC auxiliary power and shall have wide tolerance band of 100V to 240 V ($\pm 10\%$)
- The multifunction meters shall have high degree of protection (IP65 from the front) against ingress of dust & water
- The multifunction meters shall have backlit LCD display with adjustable contrast
- The meter shall be tamper-proof (password protected) to avoid mishandling by unauthorized person
- All metered values will be in "true RMS" values. The monitor shall include a keypad allowing for the viewing of different selected values. The monitor shall display the following values

Voltages	Phase-Phase / Phase- neutral
Currents	Per phase / neutral

Apparent, active and reactive power	Per phase and total
Power factor	Total
Frequency	48...52 Hz
Min. / max. values	Voltage - phase-phase, phase-neutral/ Current/ Neutral current/ Power/ Power factor/ Frequency
Active energy	Import/ export/ net
Reactive energy	Import/ export/ net
Energy demand per measuring period	Three phase average rating for active and reactive power: 1 to 60 min.
Min. / max. rating values within the measuring period	Should be possible to be measured

d) Measurement Accuracy

The multifunction meters shall be of high accuracy type and shall have the following levels of accuracy. (Accuracy class in accordance with IEC 61557-12:2007-08)

- | | |
|--------------------|---|
| 1. Voltage | Class 1 |
| 2. Current | Class 1 |
| 3. Power | Class 1 |
| 4. Power factor | Class 2 |
| 5. Active energy | Class 1 in accordance with IEC 62053-22:2003-01 |
| 6. Reactive energy | Class 3 in accordance with IEC 62053-23:2003-01 |

The meter shall have at least 2 Digital Input and 2 Digital Output as standard.

e) Communication

The meters shall have inbuilt RS485 MODBUS RTU. It shall be possible to parameterize the device either by the keys on the device or through parameterization software.

1.12 Analogue Meters

All voltmeters and ammeters shall be flush mounted of size minimum 96 mm conforming to class 1.5 of IS:1248 for accuracy.

- a) All voltmeters and indicating lamps shall be through MCB's.
- b) Meters and indicating instruments shall be flush type.

- c) All CT's connection for meters shall be through Test Terminal Block (TTB).
- d) CT ratio and burdens shall be as specified on the Single line diagram.

1.13 Current Transformers

- a) Current transformers shall be provided for Distribution panels carrying current in excess of 60 amps. All phase shall be provided with current transformers of suitable VA burden with 5 amps secondary's for operation of associated metering – [630 / 5 amp, 8 VA].
- b) The CTs shall conform to relevant Indian Standards. The design and construction shall be dry type, epoxy resin cast robust to withstand thermal and dynamic stresses during short circuits. Secondary terminals of CTs shall be brought out suitable to a terminal block which shall be easily accessible for testing and terminal connections. The protection CTs shall be of accuracy class 4.5 and measurement CTs shall be of accuracy class I.

1.14 Potential Free Contacts

Potential free contacts shall be provided for connection to Building Automation System in panels indicated in Schedule of Quantities.

1.15 Indicating Panel

- a) All meters and indicating instruments shall be in accordance with relevant Indian Standards. Meters shall be flush mounted type. Indicating lamps shall be of low burden, and shall be backed up with 2 amps MCB/MPCB as per relevant fault level and toggle switch.
- b) On all the incomers of panels, ON/OFF indicating LED lamps shall be provided and shall be suitable for operation on AC supply. Phase indicating LED lamps shall be associated with necessary ON/OFF toggle switch

1.16 Miniature Circuit Breaker (MCB)

- a) Miniature Circuit Breaker shall comply with IS-8828-1996/IEC898-1995. Miniature circuit breakers shall be quick make and break type for 240/415 VAC 50 Hz application with magnetic thermal release for over current and short circuit protection. The breaking capacity shall not be less than 10 KA at 415 VAC. MCBs shall be DIN mounted. The MCB shall be Current Limiting type (Class-3). MCBs shall be classified (B, C, D ref IS standard) as per their Tripping Characteristic curves defined by the manufacturer. The MCB shall have the minimum power loss (Watts) per pole defined as per the IS/IEC and the manufacturer shall publish the values. MCB shall ensure complete electrical isolation & downstream circuit or equipment when the MCB is switched OFF.
- b) The housing shall be heat resistant and having a high impact strength. The terminals shall be protected against finger contact to IP20 Degree of protection. All DP, TP, TPN and 4 Pole miniature circuit breakers shall have a common trip bar independent to the external operating handle.

1.17 Power Contactors:

1. Contactors shall comply with IS/IEC 60947-4 or EN 60947-4-1

2. Contactors for motor application shall be of 3 Pole AC3 duty as specified in standards.
3. Main contacts of contactors shall be silver plated copper. Spare contact kits & spare coils replacement shall be possible for the entire range, for maintenance purpose.
4. For ratings higher than 80A, coil replacement shall be possible without disturbing busbar/cable termination.
5. Contactors shall be electro-magnetically controlled, double air-break type. Contactors shall be four-pole, triple-pole, double-pole or single-pole as shown on the Drawings.
6. The contactors shall be capable of frequent switching and shall operate without derating at 55°C for AC3 applications.
7. The rated voltage of the contactor and the rated insulation voltage shall be 415V and 690V respectively.
8. The rated impulse voltage of the contactor shall be at least 8 kV.

1.18 Painting

1. All metal works and metal parts of the panel boards shall undergo a process of degreasing, pickling in acid, cold rinsing, phosphatizing, passivating and then sprayed with double coated a high corrosion resistant primer shall be applied before painting.
2. The finishing treatment shall be by application of 2-coat of grey colour paint conform to RAL code 7302.

1.19 Labels

Engraved PVC labels shall be provided on all incoming and outgoing feeder. Circuit diagram showing the arrangements of the circuit inside the distribution panels shall be pasted on inside of the panel door and covered with transparent plastic sheet.

TECHNICAL SPECIFICATIONS OF FLOOR RACEWAY AND ALLIED EQUIPMENT

RACEWAY:

Supply, Installation, Testing and commissioning of raceways made of pre-galvanised sheet with thickness of 1.6mm for distributing LV and ELV cabling (LAN cabling) in screed/ concrete floors installations as per BOQ of the tender.

1. Raceways shall be combined with junction boxes, floor boxes for wiring devices, fixing and coupler accessories. It shall consist of body & cover. Cover fitted on to the body with screws & can be opened easily, if required.
2. Raceway should be specially treated corrosion proof rectangular shape to ensure high tensile strength.
3. Top and bottom plates are double folded and spot welded together to give the required rigidity and at the same time to prevent seepage of concrete or screed water.
4. Material: Pre-galvanized sheet steel
5. Thickness: 1.6mm
6. Length: 2.5m
7. Depth: 25mm
8. Compartment: Double
9. Material Specification as per IS277:2003
10. Race ways should be supplied with complete accessories i.e. fixing brackets & couplers for joining raceways from the same manufacturer. Junction/Floor boxes shall be for direct access to wires/cables at the intersection of raceways.
11. Zinc Coating Thickness: 275 GSM
12. Load Bearing Capacity: 2.5 Ton force (metric)
13. Temperature Handling: -5°C To 60°C
14. IP42 protection
15. 3rd party test certifications from Govt. approved agency or Govt. institute or Reputed Private agency to provide against all the above specification. And salt spray test certificates for the raceways need to be provided for corrosion resistance.

UNDERFLOOR JOINT SLEEVES:

Material:

The joint sleeves shall be made from high-quality galvanized steel or a comparable corrosion-resistant material with a 275 GSM (grams per square meter) thickness for durability and long-lasting performance.

Dimensions:

Height: 25 mm to match the height of the under-floor trunking.

Lid Thickness: 1.6 mm, designed to provide robust support and ensure proper alignment and secure joining of trunking segments.

Length: 75 mm, suitable for covering and securely joining adjacent sections of the trunking system, providing a seamless connection.

Compatibility:

The joint sleeve shall have a smooth design, free from sharp edges or burrs to ensure safety during installation and to prevent damage to cables within the trunking.

It should allow for easy assembly and disassembly for maintenance purposes.

Installation:

The joint sleeves should be installed securely to connect two sections of the under-floor trunking, ensuring no gaps or misalignment.

Proper fixing methods (such as screws, clips, or other appropriate fasteners) shall be used to ensure the joint sleeve is tightly affixed to the trunking sections.

The sleeve should ensure a firm connection, maintaining the structural integrity and preventing any movement or displacement.

ACCESS OUTLET BOX:**a) Material:**

275 GSM (grams per square meter) indicates the thickness and durability of the joint sleeves, usually representing galvanized steel or a similar material.

b) Dimensions:

Height: 25 mm.

Lid Thickness: 1.6 mm (this likely refers to the thickness of the material covering or sealing the joint).

Length: 75 mm (this is the length of the joint sleeve).

Compatibility: The sleeves should be specifically designed for use with 150 mm width, 2-compartment underfloor trunking systems, ensuring proper alignment and secure installation.

c) Installation Process:

Preparation: Ensure that the trunking system is laid out properly, with correct spacing for the joint sleeves.

d) Fitment: The sleeves should slide or snap onto the trunking, aligning with both compartments securely.**e) Fastening:** Depending on the design, the sleeves may require screws or other fasteners for a more permanent installation.

Ensure that the sleeves are supplied as per the required material standards and comply with any relevant building or electrical safety codes.

Electrical Outlets:

The box shall be equipped with the following electrical outlets:

a) 10 Nos. 6/16 Amp sockets: Suitable for standard office equipment and devices requiring power supply.

- b) Nos. 16 Amp switches: To control the power supply to the sockets, ensuring convenience and safety.
- c) Data and Communication Sockets:
- d) Nos. RJ45 sockets: For network (Ethernet) connections, ensuring proper connectivity for computers or other network devices.
- e) Nos. RJ11 sockets: For telephone connections, enabling voice communication lines.
- f) Wiring Management: The outlet box shall have adequate internal space for safe and organized wiring management, preventing overcrowding and minimizing interference between power and data cables. Proper grommets and bushings must be used to ensure that cables are routed safely without sharp edges that could damage insulation.

UNDERFLOOR JUNCTION BOX:

Material:

The junction box shall be made of high-quality metallic material, such as galvanized steel or stainless steel, to ensure durability, corrosion resistance, and fire safety.

Dimensions:

Size: 150 mm x 150 mm to provide adequate space for housing electrical connections or cables at cross-points.

Height: Adjustable between 55 mm to 70 mm to cater to different under-floor heights and to facilitate smooth cable management.

Top Recess:

The junction box shall have a top recess of 8 mm to accommodate floor finishes such as carpet, vinyl, or tile, ensuring a flush installation with the finished floor surface for aesthetic and practical purposes.

Lid:

The box shall be equipped with a metallic lid that is designed to fit snugly over the box, providing protection for the cables and connections inside.

The lid must be robust enough to withstand normal floor traffic and light loads, while also being easy to remove for maintenance access.

Conformity:

The junction box should conform to relevant international and local standards (e.g., IEC or BS standards) for electrical and cable management systems, ensuring it is safe for use in commercial or industrial environments.

VERTICAL ACCESS BOX:**Material:**

The vertical access box shall be made from high-quality metallic material, such as galvanized steel, aluminum, or stainless steel, ensuring durability, corrosion resistance, and long service life.

Dimensions:

Size: 250 mm (height) x 200 mm (width) x 45 mm (depth), providing adequate space for housing electrical connections, data cables, or other utilities.

The depth of 45 mm ensures that the box is compact while providing sufficient space for secure cable management and access.

Design:

The box shall feature a vertical orientation, suitable for installation on walls or other vertical surfaces where access to wiring or cable connections is required.

The design must include provisions for secure mounting, ensuring the box is flush with the surface where it is installed.

The access box should include knockouts or cutouts for easy entry and exit of cables or conduits, with smooth edges to prevent damage to the cables.

Lid/Cover:

The box shall be fitted with a removable metallic lid or cover, which is easy to open for access to the contents but securely fastened to protect the internal components from external damage or tampering.

The lid should be designed to blend seamlessly with the box, providing a neat and professional appearance when installed.

Mounting:

The access box should come with mounting brackets or pre-drilled holes to facilitate easy and secure installation on walls or other vertical surfaces.

The mounting system must ensure that the box is securely fixed, level, and capable of withstanding regular use or environmental conditions.

SCHEDULE OF RATES

1. The schedule of rates should be read in connection with all the other sections of the tender.
2. The quantities shown against the items of work are only approximate and may vary to any extent. No extra whatsoever shall be entertained.
3. The rates inserted in the bills of quantities are to be for the full inclusive value of the work described under the several items, including all cost and expenses which may be required in and for the construction and full protection of the work described, together with all risks, liabilities, and obligations set forth or implied in the documents on which the tender is based. The quoted rates shall be for all heights, lifts, and lead unless otherwise mentioned specifically in the description of the item.
4. General direction and description of work and materials given elsewhere in the contractor documents are not necessarily repeated in the Bill(s) of quantities. Reference to be made to the other documents for the full information/details.
5. The contractor shall be deemed to have visited the site before quoting for the tender and to have examined for himself the conditions under which the work will be carried out including local conditions affecting labor and to have studied the items of the bills of quantities, the drawing and specification, relating to them and to have satisfied himself that the rates quoted by him provide for all minor accessories and contingent works or service as necessary for the works described even though there are not specifically defined.
6. Tenderer is advised to read items of works carefully and quoted the rates accordingly. However, if he quotes different rates for the same item(s) of work under different schedules of items, the lowest rates quoted shall be made applicable to all the Bill of Quantities and the contract sum shall be corrected accordingly.
7. Where an item of work not mentioned in a particular bill of quantities, is required to be executed and where the rate for such an item of work is quoted under a different bill of quantities forming a part of this contract, then the contractor being called upon shall execute the work and shall be paid at the rate so quoted. Nothing extra over shall be payable on this account.
8. The drawing(s) attached with this tender document are for the purpose of tender, giving the tenderer a general idea of the nature and the extent of works to be executed.
9. The rates quoted by the tenderer shall be deemed to be for the execution of the works in accordance with the "Construction Drawings" (to be supplied to the contractor at the "Design Aspect" of these drawings).
10. The rates quoted by the tenderer shall include all labor, tools and plants, materials inclusive of all, transport, loading, unloading charges, all levies, all taxes, excise duties, etc. at the time of quoting their rates. The quoted rates shall remain firm throughout the contract period. No escalation on prices of labor and materials shall be entertained.

LETTER OF UNDERTAKING

To,

The Assistant General Manager
LB & RSETI.SBI, Local Head Office
Bhubaneswar

Dear Sir,

Addition, Alteration & Construction of G+1 Storied Building for RSETI Rayagada, Odisha

Having examined the terms & conditions, drawings, specifications, design relating to the works specified in the memorandum hereinafter set out and having visited and examined the site of the works specified in the said memorandum and having acquired the requisite information relating thereto and affecting the quotation, I/We hereby offer to execute the works specified in the said memorandum within the time specified in the said memorandum on the percentage rate basis mentioned in the attached schedule and in accordance in all respect with the specifications, design, drawings and instructions in writing referred to in conditions of Tender, conditions of contract and with such conditions so far as they may be applicable.

(a)	Description of work	Addition, Alteration & Construction of G+1 Storied Building for RSETI Rayagada, Odisha
(b)	Earnest Money	Rs.1,86,000/- by means of Demand Draft / Pay Order from any scheduled Nationalized Bank drawn in favor of "SBI" and payable in "Bhubaneswar".
(c)	Time allowed for completion of work from the date of issue of work order.	12 calendar months from the date of commencement as per tender.

Should this tender be accepted, I/we hereby agree to abide by and fulfill the terms and provisions of the said conditions of Contract annexed hereto so far as they may be applicable or in default thereof to forfeit and pay to SBI, the amount mentioned in the said conditions.

I/we have deposited Demand Draft / Banker's Cheque / FDR for a sum of **Rs.1,86,000/-** as Earnest money deposit with the SBI. Should I/we do fail to execute the contract when called upon to do so, I/we hereby agree that this sum shall be forfeited by me/us to SBI.

We understand that as per terms of this tender, the SBI may consider accepting our tender in part or whole or may entrust the work of **Addition, Alteration & Construction of G+1 Storied Building for RSETI Rayagada, Odisha**. We, therefore, undertake that we shall not raise any claim / compensation in the eventuality of Bank deciding to drop any/part of the building / buildings from the scope of work of this tender at any stage during the contract period. Further, we also undertake to execute the work entrusted to us in phases on our approved rates and within the stipulated time limit without any extra claim for price escalation.

As when ask by the SBI, I/we shall submit the supporting technical data sheet, specification and make of the items as per the BOQ.

We, hereby, also undertake that, we will not raise any claim for any escalation in the prices of any of the material during the currency of contract/execution/completion period.

Yours faithfully,

Signature of contractor
With Seal

PRICE BID (PART-2)

**Bidders to submit the Price- Bid online in the
E-Tendering Portal only.**