

STATE BANK OF INDIA

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

Tender Document (Technical Bid)

For

Addition & Alteration to Existing SBRSETI Building at
Bolangir, Odisha

Tender No – LB & RRB/2024-25/01 Dated: 25.07.2024

Name of the Tenderer : _____

Address : _____

**Last Date & Time of Submission of Tender: On 08.08.2024 at 14:00
Hrs.**

Eligibility Criteria: Contractor empaneled vendors under the category CA & CB for Civil works costing above Rs 100 Lakhs up to Rs 500 Lakhs under Bhubaneswar Circle of State Bank of India

Architects / Consultants

Architects Creation

B-9, 2nd Floor, Saheed Nagar

Bhubaneswar – 751007

Ph. No. – (0674) 2547838

NOTICE INVITING e-TENDER (NIeT)

Tender No. LB & RRB/2024-25/01

Dated 25.07.2024

SBI , LB & RRB Department, LHO Bhubaneswar , invites online item rate E- Tenders for ADDITION & ALTERATION TO EXISTING SBRSETI BUILDING AT BOLANGIR, ODISHA from Bank's empaneled Civil contractors under the category " Civil work: CA & CB (Rs 100.00 Lakhs – Rs 500.00 Lakhs)" under SBI Bhubaneswar Circle. The other details of the tender are as under:

1	Name of Work	ADDITION & ALTERATION TO EXISTING SBRSETI BUILDING AT BOLANGIR, ODISHA
2	Eligibility of criteria	Contractors/Vendors empaneled under the category "Civil work CA & CB (Rs 100.00 Lakhs – Rs 500.00 Lakhs)" under Bhubaneswar Circle, are eligible to apply.
3	Estimated Cost	Rs. 1,18,96,103.60 + GST
4	Time for completion of work.	10 (Ten) Months from date of Commencement or handing over of site, whichever is earlier.
5	Earnest Money Deposit (EMD)	Rs. 1,19,000/- (Rupees One Lakh Nineteen thousand Only) in the Form of Demand Draft/Banker's Cheque issued by any Nationalized /Scheduled Bank Drawn in favour of "State Bank of India." Payable at Bhubaneswar" which is to be submitted on or before last date and time of submission of tender in a separate envelope super scribing "EMD". Without EMD Tender will be rejected. Contractors who have already deposited one time EMD in Premises Department may attach scan copy of EMD.
6	Availability of Tender document.	From 25.07.2024 to 08.08.2024 from Bank's website "https://www.sbi.co.in/portal/web/home/procurement-news" or www. tenderwizard.com / SBI ETENDER
7	Security Deposit (SD)	5% of Final Work Value during settlement of Final Bill.
8	Additional Security Deposit (ASD) / Additional Performance Guarantee (APG)	The successful (L1) Contractor/vendor, whose tender is accepted by the Bank and shall be bound to deposit ASD/APG if the Price Quoted is below 7.5% of Estimate Cost in the form of BG or FDR.
9	Last date & time for submission of Online Technical Bid.	The eligible empaneled contractor under the Bhubaneswar Circle are required to submit/enclose the scan copies of following document online on or before Dt. 08.08.2024 up to 14:00 Hrs:
10	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 Dt. 08.08.2024 up to 14:00 Hrs.

11	Date & Time of opening of Online Technical Bid.	15:00 Hrs on Dt. 08.08.2024 at Service Provider's portal Authorized representatives of vendors may be present during opening of the Tender. However, Bids would be opened even in the absence of any or all of the vendor representatives.
12	Date & Time of opening of Online Price Bid	08.08.2024 at 16:00 Hrs. at Service Provider's portal.
13	Validity for Offer	3 (Three) Months from The Date of Opening of Price-Bid
14	Commencement of Work.	7th Day from the date of receiving of Work Order or handing over of site whichever is earlier
15	Deduction of income tax and GST	A) Income Tax will be deducted at source as per Govt. Guidelines. B) Reimbursement of GST will be made only on submission of proper GST invoice as per applicable GST provision. The contractor should comply with the following. 1. Contractor should have valid GST Registration Number. 2. Invoice should specifically/separately disclose the amount of GST levied at applicable rate as per GST provision. 3. In case of Correction in the bills after scrutiny, contractor should submit fresh, GST invoice/bill for processing payment by the Bank. 4. Contractor should timely file his GST return in accordance with GST provisions to enable the bank to claim the GST credit.
16	Terms and Mode of payment	i) No advance / interim / mobilization payment will be entertained / made to Contractor for work value up to 15.00 lakhs. ii) After successful completion of entire work balance or 100% payment will be released against submission of tax invoice and work completion certificates. iii) 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. iv) Payments towards the above work shall be made by SBI. The GST Number of State Bank of India for Bhubaneswar is 21AAACS8577K1Z1.
17	Liquidated Damages for Delay	If the bidder is not able to complete the work within stipulated time/days in line to this contract from date of issue of the work order, LD shall be imposed at the rate 0.5 % Per week for delay subject to maximum amount of 5% of Contract Value.
18	Defects Liability Period	12 Months (Twelve months)

19	Contact Person, Phone No of officials.	For Technical queries: 1. Jagadish Chandra Hati (Engineer-in-charge), A.O, Sambalpur Ph: 9900234280 email: jagadish.hati@sbi.co.in or 2. Architects / Consultants: M/s Architects Creation B-9, 2nd Floor, Saheed Nagar, Bhubaneswar – 751007 Ph. No. – (0674) 2547838
20	For any details contact: E-Tendering Agency	Kushal Bose Antares Systems Ltd. Mob.+91 7686913157 Email: kushal.b@antaressystems.com

- (i) 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.
- (ii) The bidder, who is the authorized representative and participating on behalf of company/ Dealer / vendor, should have a valid digital signature certificate (DSC) for this e tender. The validity of the DSC should be at least 3 months.
- iii. **Submission of Technical bid:** Contractors shall download the entire Technical Bid to get acquainted with the terms and conditions and shall upload compulsorily the scan copy of documents as under technical bid without fail.
- a) **Earnest Money Deposit (EMD):** Original EMD in the form of DD of requisite amount or scanned copy of onetime EMD already submitted to the P&E Dept., LHO, Bhubaneswar
- b) **Process Compliance form** in company letter head duly signed and stamped by authorized representative.
- c) **Letter of Undertaking** in company letter head duly signed and stamped by authorize representative.
- iv. **Submission of Price bid:** Shall contain the Electronic format of Price Bid. No condition/ stipulation in Cover-II other than unconditional general rebate shall be accepted.
- Cover-II (Price Bid) will be opened only of those bidders who are successfully in Technical Bid (Cover- I) after through scrutiny. **The contractor/ vendor can view the Tender opening details through their respective log in Ids on the above-mentioned e-tender portal (Website).**
- v. The process of online re-bidding amongst Two or more contractors offering same rates shall continue till L-1 bidder.
- vi. In case, any of such contractor(s) (quoted same tender amount during initial bidding or subsequent re-bidding) 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.
- vii. In case all the lowest contractors those have quoted same tendered amount, refuse to participate in online revised bidding process for the project, the EMD of such Contractors shall be forfeited and the tenders shall be re-invited for the project.

viii. 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.

ix. 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.

x. 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.

xi. 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.

xii. Conditional tenders are liable for rejection.

xiii. Bidders need to submit an undertaking, if quoted amount is 7.5% less than the estimated amount. Further, the vendor is liable to submit with relevant justifications on their letter head for the items (schedule) which quoted less/high.

xiv. Contractors deposited EMD in Premises Department may attach scan copy of EMD. Vendor having NSIC certificate are exempted from Tender Fees and EMD.

Sd/-

The Asst. General Manager (LB & RRB)
State Bank of India,
Local Head Office, 3rd Floor,
III/1, Pandit Jawaharlal Neheru Marg,
Bhubaneswar-751001

SAMPLE BUSINESS RULE DOCUMENT

ONLINE E-TENDERING FOR ADDITION & ALTERATION TO EXISTING SBRSETI BUILDING AT BOLANGIR, ODISHA

(A) Business rules for E-tendering:

1. Only empaneled contractors with SBI Under appropriate category who are Invited by the project Architect/SBI shall only be eligible to participate.
2. SBI will engage the services of an E-tendering service provider who will provide necessary training and assistance before commencement of online bidding on Internet.
3. In case of e-tendering, SBI will inform the vendor through its service provider to enable them to participate contact and get trained.
4. Business rules like event date, closing and opening time etc. also will be communicated through service provider for compliance.
5. Contractors have to send by email, the compliance form in the prescribed format (provided by service provider), before start of E-tendering. Without this the vendor will not be eligible to participate in the event.
6. **The Contractors will be required to submit the tender as mentioned in NIT Sl. No.(iii). Contractors not submitting any one or more documents shall not be eligible to participate in the on line tender.**
7. E-tendering will be conducted on schedule date & time as mentioned in the NIT
8. The e-tendering will be treated as closed only when the bidding process gets closed in all respects for the item listed in the tender.

(B) Terms & conditions of E-tendering:

SBI shall finalize the tendering process of the item through online bidding mode. /SBI has made arrangement with M/s Antares Systems Limited (ASL), Bangalore 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.

1. 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 ASL furnishing the price, the bidder wants to bid online, with a request to ASL 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 ASL in a readable / legible form and also the Bidder should simultaneously check up with ASL 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 up

loaded by ASL 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 ASL at the time of receipt of the fax message from the bidders, ASL will not be uploading the prices. It is to be noted that either SBI or ASL 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 whatever 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.

2. ASL 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.

3. BIDDING CURRENCY AND UNIT OF MEASUREMENT: Bidding will be conducted in Indian Rupees (INR) per -one- (Unit) of the items.

4. BID PRICE: The Bidder has to quote the Total cost to SBI of the items specified inclusive of all taxes, duties, freight, service tax, overhead, contractor's profit etc.

5. 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.

6. The bidder has to provide a detail break up for his commercial offer in the prescribed format as given by the Bank.

7. 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. Should you back out and not execute the work as per the rates quoted, the earnest money deposited by you with us in this regard shall be forfeited without further reference to you.

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

9. At the end of the online Tendering process, /SBI will decide upon the winner. /SBI's decision on award of Contract shall be final and binding on all the Bidders.

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

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

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

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

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

10. 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 ASL can decide to extend, reschedule or cancel any Auction. Any changes made by SBI and / or ASL, after the first posting will have to be accepted if the Bidder continues to access the site after that time.
- ASL shall not have any liability to Bidders for any interruption or delay in access to the site irrespective of the cause.
- ASL 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.

☑ 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 Process Compliance Form duly signed to M/s Antares Systems Limited (ASL), Bangalore before due date.

☑ After the completion of the Auction event, all the Bidders have to submit the Price Breakup immediately to M/s Antares Systems Limited (ASL), Bangalore for further proceedings.

N.B.

-All the Bidders are required to submit the Process Compliance Statement (Annexure II) duly signed in the eTender portal.

-All the bidders are requested to ensure that they have a valid digital signature Certificate well in advance to participate in the online event.

PROCESS COMPLIANCE STATEMENT (ANNEXURE II)

(The bidders are required to print this on their company's letter head and sign, stamp duly filled before uploading)

To
M/s Antares Systems Limited,
Registered Office at: - #24, Sudha Complex,
3rd Stage, 4th Block,
Bangalore – 560079.
Ph.: - 080-49352000 / 40482000
Fax: - 080-49352034

Date:

Sub: Agreement to the Process related Terms and Conditions for the online bidding

Dear Sir,

This has reference to the Terms & Conditions for the online bidding mentioned in the Tender for **ADDITION & ALTERATION TO EXISTING SBRSETI BUILDING AT BOLANGIR, ODISHA, Tender No: LB & RRB/2024-25/01 dated 25.07.2024.**

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 online bidding and the RFP as mentioned in your letter and confirm our agreement to them.
- 3) We also confirm that we have taken the training on the auction tool and have understood the functionality of the same thoroughly.
- 4) We confirm that SBI Group and ASL shall not be liable & responsible in any manner whatsoever for my/our failure to access & bid on the e-auction platform due to loss of internet connectivity, electricity failure, virus attack, problems with the PC, any other unforeseen circumstances etc. before or during the auction event.
- 5) We understand that in the event we are not able to access the auction site, we may authorize ASL to bid on our behalf by sending a fax containing our offer price before the auction close time and no claim can be made by us on either State Bank Group or ASL regarding any loss etc. suffered by us due to acting upon our authenticated fax instructions.
- 6) I/we do understand that ASL may bid on behalf of other bidders as well in case of above mentioned exigencies.
- 7) We also confirm that we have a valid digital certificate issued by a valid Certifying Authority.
- 8) We also confirm that we will fax the price confirmation & break up of our quoted price as per Price Bid and the format as requested by SBI / ASL.
- 9) We, hereby confirm that we will honour the Bids placed by us during the auction process.

With regards

Signature with company seal

Date:

Name –

Company / Organization –

Designation within Company / Organization –

Address of Company / Organization

ARTICLES OF AGREEMENT

ARTICLES OF AGREEMENT made on this _____ day of Two Thousand Twenty Four.

BETWEEN

State Bank of India (hereinafter referred to as 'the OWNER' which expression shall include its successor or successors and assigns) of the ONE PART, and having its Head Office at _____

AND

M/s _____ having its registered office at _____ (hereinafter referred to as the CONTRACTOR') of the OTHER PART.

WHEREAS the Owner is desirous of having the **Addition & Alteration to Existing SBRSETI Building at Bolangir, Odisha.**

AND WHEREAS the Owner/Employer in order to effectively carry out the said the **Addition & Alteration to Existing SBRSETI Building at Bolangir, Odisha**, engaged M/s Architects Creation, B-9, Sahid Nagar, Bhubaneswar – 751007 (hereinafter referred to as Architects/Consultants) to prepare plans, drawings and specifications describing the works to be executed and to all for tenders from contractors for the job, to open tender received at the office of the Owner, to scrutinize and recommend to the Owner the name and names of the contractor/contractors from whom the tenders were received and to issuing work order to the contractor or contractors so recommended after having the approval and acceptance thereof from the Owner/Employer.

AND WHEREAS the Owner / Employer has caused the plans, drawing Nos. _____ specifications, priced schedule of quantities of the work of the **Addition & Alteration to Existing SBRSETI Building at Bolangir, Odisha**, as per General Conditions of the contract and Special Condition and Instructions to the Tender prepared with the assistance of the said Architects/Consultants subject to which the offer of the contractor shall be accepted.

AND WHEREAS the tender of the contractor for the said work has been approved by the Owner.

AND WHEREAS the contractor has deposited with the Owner E.M.D. of Rs. _____ as security deposit for the due performance of the agreement.

AND WHEREAS the Owners have issued work order therefore to the contractor.

AND WHEREAS the relevant drawing inclusive of the specifications, priced schedule of quantities, conditions of contract and special conditions (hereinafter collectively referred as to the said conditions) have been signed by the parties hereto and the contractor has agreed to execute the works upon and subject to the said conditions.

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the payments to the Contractor as hereinafter provided the Contractor shall upon and subject to the said conditions execute and complete the works on location as shown in the said drawings etc.

2. The Employer will pay to the contractor the sum of Rs. _____ (Rupees _____) (hereinafter called the 'Contractor sum') or such other sum as shall become payable hereunder at the times and in the manner specified in the said conditions.
3. The term "Architect/Consultants" in the said conditions shall mean the said M/s Architects Creation and in the event of the said Architects / Consultants ceasing to be the Architects / Consultants for the purpose of this contract such other person or persons as shall be nominated for the purpose by the Owner provided always that no person subsequently appointed to be the Architects/Consultants under this contract shall be entitled to disregard or overrule any decision on approval expressed in writing by the out-going Architects/Consultants for the time being if the same had been done under instruction from the Owner.
4. The Plan, Agreement and Documents above-mentioned shall form the basis at this contract and all disputes to be decided in the manner prescribed in the conditions attached hereto.
5. The said contract comprises the interior works as above mentioned, and all subsidiary works connected therewith within the same site as may be ordered to be done from time to time by the said Owner through Architects/Consultants for other Architects/Consultants as the case may be even though the said works may not be shown on the drawings or described in the said specifications or the priced schedule of quantities.
6. Notwithstanding what are stated in the general conditions, conditions of contract and hereinbefore stated the Owner through Architects/Consultants reserved to himself the right to alter the drawings and nature of the work of adding to or omitting any items of works from or of having portions of the same carried out departmentally or otherwise and such alterations or variations shall be carried out without prejudice to this contract.
7. The said conditions shall be read and be treated as forming part of this agreement and the parties hereto will respectively be bound hereby and to abide by and submit themselves to the conditions and stipulations and perform the same on their parts to be respectively observed and preferred.
8. Any dispute arising under this agreement between the parties hereto shall be referred for adjudication to a sole arbitration in the manner and in terms of the provisions as laid down in the General Conditions of Contract. The award of the arbitrator shall be final and binding on both the parties.

AS WITNESS our hand this

day of _____

SIGNED by the said
In the presence of

Owner

SIGNED by the said
In the presence of

Contractor

INSTRUCTIONS TO THE TENDERERS

1.0 SCOPE OF WORK

Sealed tenders are invited by M/s Architects Creation for and on behalf of State Bank Rural Self Employment Training Institute, Odisha, Bhubaneswar (SBRSETI) having its office at State Bank of India, 3rd Floor, Local Head Office, III/I, Pt. Jawaharlal Nehru Marg, Bhubaneswar for the work of the **Addition & Alteration to Existing SBRSETI Building at Bolangir, Odisha** at an estimated cost of **Rs. 118.96 Lakhs plus GST**.

1.1 Site and its Location

The proposed work is to be carried out at **Bolangir, Odisha**.

2.0 Tender Documents

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

- Instructions to tenderers
- General Conditions of Contract
- Special conditions of Contract
- Technical specifications
- Price 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

Drawings

Special Conditions of Contract

General Conditions of Contract

Instructions to Tenderers

2.3 Complete set of tender documents can be downloaded from the Bank's official website www.sbi.co.in under "Procurement news" or www.tenderwizard.com/SBIETENDER.

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 him regarding the availability of water, power, transport, and communication facilities, the character quality and quantity of the materials, labour, the law, and order situation, climatic local 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 tender.

4.0 Earnest Money

- 4.1 The tenderers are requested to submit the Earnest Money of **Rs. 1,19,000.00 (Rupees One Lakh Nineteen Thousand)** only in the form of DD of Banker's Cheque in favour of **State Bank of India** payable at **Bhubaneswar** drawn on any scheduled Bank in India.
- 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 tenderers 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 DD drawn in favour of **State Bank of India** payable at **Bhubaneswar** 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 Additional Security Deposit

In case L-1 bidder quotes abnormally low rates (i.e. **7.5 %** or more, below estimated project cost), the bank may ask such bidder to deposit Additional Security Deposit (ASD) equivalent to difference of estimated cost vis-à-vis L-1 quoted amount for due fulfilment of contract. Such ASD could be in the form of FDR / Bank's guarantee in the Bank's name as per format

approved by the Bank. On successful completion of work ASD will returned to the contractor. In case contractor fails to complete the work in time or as per tender specification or leave the job incomplete, the bank will be at liberty to recover the dues from ASD or to forfeit such ASD as the case may be within its sole discretion

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

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 30 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

Time is essence of the contract. The work should be completed in all respects in accordance with the terms of contract within a period of **10 (Ten) Calender Months** from the date of handing over site.

9.0 Validity of Tender

Tenders shall remain valid and open for acceptance for a period of 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 acceptable 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 Rate and Prices

11.1 In case of item rate tender

11.1.1 The tenderers shall quote their rates excluding GST for individual items both in words and figures in case of discrepancy between the rates quoted in words and figures the unit rate quoted in words will prevail. If no rate is quoted for a particular item the contractor shall not be paid for that item when it is executed. 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.

11.1.2 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.

11.1.3 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 should immediately bring to the knowledge of the Architect / Bank.

11.1.4 Each page of the BOQ shall be signed by the authorized person and cutting or overwriting shall be duly attested by him.

11.1.5 Each page shall be totaled and the grand total shall be given.

11.1.6 The rate quoted shall be firm and shall include all costs, allowances, taxes, levies but excluding GST.

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 State Bank of India (Client) 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 / Bank 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 ‘SBRSETI’ shall mean State Bank Rural Self Employment Training Institute, Odisha, Bhubaneswar having its office at State Bank of India, 3rd Floor, Local Head Office, III/I, Pt. Jawaharlal Nehru Marg, Bhubaneswar and includes the client’s representatives, successors and assigns.

‘Architects / Consultants’ shall mean M/s Architects Creation, B-9, Sahid Nagar, Bhubaneswar.

1.1.2 ‘Site Engineer’ shall mean an Engineer appointed by SBRSETI as their representative to give instructions to the contractors.

1.1.3 ‘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.

1.1.4 ‘Engineer’ shall mean the representative of the Architect / Consultant.

1.1.5 ‘Drawings’ shall mean the drawings prepared by the Architects and issued by the Engineer and referred to in the specifications and any modifications of such drawings as may be issued by the Engineer 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 herein after contained.

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

1.1.7 “Week” means seven consecutive days.

1.1.8 “Day means a calendar day beginning and ending at 00 Hrs and 24 Hrs respectively.

2.0 Language

The language in which the contract documents shall be drawn shall be in English.

3.0 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 description of the item in the specifications and descriptions in bills of quantities of the same item, the former shall be adopted.
- (a) In case of difference between rates written in figures and words, the rate in words shall prevail.
- (b) Between the duplicate / subsequent copies of the tender, the original tender shall be taken as correct.

4.0 Scope of Work

The contractor shall carry out complete and maintain the said work in every respect in strict accordance with this contract and with the directions of and to the satisfaction of the Bank to be communicated through the 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 Architects / Consultant'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 any substitution of any other materials therefore the removal and / or re-execution of any work executed by him. The dismissal from the work of any person employed a/ engaged thereupon.

5.0(i) Letter of Acceptance

Within the validity period of the tender SBRSETI shall issue a letter of acceptance either directly or through the architect by registered 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 SBRSETI and the contractor.

(ii) Contract Agreement

On receipt of intimation of the acceptance of tender from the SBRSETI / Architect the successful tenderer shall be bound to implement the contract and within fifteen days thereof he shall sign an arrangement in a non-judicial stamp paper of appropriate value.

6.0 Ownership of drawings

All drawings, specifications and copies thereof furnished by the SBRSETI through its architects / consultants are the properties of the SBRSETI. They are not to be used on other work.

7.0 Detailed drawings and instructions

The SBRSETI 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 prepare a detailed programme schedule indicating therein the date of start and completion of various activities on receipt of the work order and submit the same to the SBRSETI through the architect / consultant.

8.0 Copies of Agreement

Two copies of agreement duly signed by both the parties with the drawings shall be handed over to the contractors

9.0 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 completing 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 SBRSETI on account of such breach to pay liquidated damages at the rate of 05% of the contract value.

10.0 Materials, Appliances and Employees

Unless or otherwise specified the contractor shall provided 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 and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him. Workman whose work or behavior is found to be unsatisfactory by the SBRSETI / architect / consultant he shall be removed from the site immediately.

11.0 Permits, Laws and Regulations

Permits and licenses 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, and ordinance rules, applicable to the contract. If the contractor observes any discrepancy between the drawings and specifications, he shall promptly notify the SBRSETI 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 SBRSETI any legal actions arising there from.

12.0 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 lay out 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 SBRSETI.

13.0 Protection of works and property

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

He shall take adequate care and steps for protection of the adjacent properties. The contractor shall take all precautions for safety and protections of his employees on the works and shall comply with all applicable provisions of Govt. and local bodies safety laws and building codes to prevent accidents, or injuries to persons or property on, about or adjacent to his place of work. The contractor shall take insurance covers as per clause 24.0 at his own cost. The police may take in joint names of the contractor and the SBRSETI and the original policy may be lodged with the SBRSETI.

14.0 Inspection of Work

The SBRSETI / 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 SBRSETI, Architect / consultant and their representatives necessary for inspection and examination and test of the materials and workmanship. No person unless authorized by the SBRSETI / 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.

15.0 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, assign or underlet the contract or any part or share thereof or interest therein without the written consent of the SBRSETI 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.

16.0 Quality of Materials, workmanship & Test

All materials and workmanship shall be best of the respective kinds described in the contract and in accordance with Architect / consultant instructions and shall be subject from time to time to such tests as the architect / consultant may direct at the place of manufacture or fabrication or on the site or an approved testing laboratory. The contractor shall provide such assistance, instruments, machinery, labour and materials as are normally required for examining measuring sampling and testing any material or part of work before incorporation in the work for testing as may be selected and required by the architect / consultant.

- (ii) 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 Architect / Consultant. Before submitting the sample / literature the contractor shall satisfy himself that the material / equipments for which he is submitting the sample / literature meet with the requirement of tender specification. Only when the samples are approved in writing by the Architect / Consultant the contractor shall proceed with the procurement and installation of the particular materials / equipment. The approved samples shall be signed by the Architect / Consultant for identification and shall be kept on record at site office until the completion of the work for inspection / comparison at any time. The Architect / Consultant 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 / equipments etc. shall be to the account of the contractor.

17.0 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 fulfillment of contract.

18.0 Contractor's Superintendence

The contractor shall give necessary personal superintendence during the execution of the works and as long, thereafter, as the Architect / Consultant may consider necessary until the expiry of the defects liability period, stated hereto.

19.0 Quantities

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 and quantities. The rate quoted shall remain valid for variation of quantity against individual item to any extent. The quantities shown in BOQ are tentative and may vary to any extent. No extra / compensation shall be entertained.

20.0 Works to be measured

The Architect / Consultant 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 Architect in taking such measurements and calculations 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 Architect / Consultant 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 over writings shall be made in the M 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 Architect / Consultant shall be final. All authorized extra work, omissions and all variations made shall be included in such measurement.

21.0 Variations

No alteration, omission or variation ordered in writing by the Architect / Consultant shall vitiate the contract. In case the SBRSETI / Architect / Consultant thinks proper at any time during the progress of works to make any alteration in, or additions to or omissions 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 alterations 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 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.

22.0 Valuation of Variations

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

- (a) (i) 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.
- (ii) 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 Architect / Consultant 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 Architect / Consultant shall fix such rate or prices as in the circumstances in his opinion are reasonable and proper, based on the market rate.
- (d) Where the 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 Architect / Consultant) 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.

23.0 Final measurement

The measurement and valuation in respect of the contract shall be completed within six months of the virtual completion of the work.

24.0 Virtual Completion Certificate (VCC)

On successful completion of entire works covered by the contract to the full satisfaction of the SBRSETI, the contractor shall ensure that the following works have been completed to the satisfaction of the SBRSETI:

- (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 SBRSETI 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 SBRSETI and shall clear, level and dress, compact the site as required by the SBRSETI.

- (d) Shall put the SBRSETI in undisputed custody and possession of the sire and all land allotted by the SBRSETI.
- (e) Shall hand over the work in a peaceful manner to the SBRSETI.
- (f) All defects/imperfections have been attended and rectified as pointed out by the SBRSETI to the full satisfaction of SBRSETI.

Upon the satisfactory fulfillment by the contractor as stated above, the contractor shall be entitled to apply to the Architect / Consultant is satisfied of the completion of the work. Relative to which the completion certificate has been sought, the 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 SBRSETI'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 works or work at any site be constructed as a waiver of any right or claim of the SBRSETI against the contractor in respect of works or work at the site and in respect of which the VCC has been issued.

25.0 Work by other agencies

The SBRSETI / Architect / Consultant reserves the right 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 SBRSETI. Such work shall be carried out in such manner as not to impede the progress of the works included in the contract.

26.0 Insurance of Works

26.1 Without limiting his obligations and responsibilities under the contract the contractor shall insure in the joint names of the SBRSETI and the contractor against all loss of damages from whatever cause arising other than the expected risks, for which he is responsible under the terms of contract and in such a manner that the SBRSETI and contractor are covered for the period stipulated 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 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 SBRSETI which approval shall not be unreasonably withheld and the contractor shall whenever required

produce to the Architect / Consultant the policy of insurance and the receipts for payment of the current premiums.

26.2 Damage to Persons and Property

The contractor shall, except if and so far as the contract provides otherwise indemnify the SBRSETI 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 rise out of or in consequence of the execution and maintenance of the works and against all claims proceedings, damages, cost, 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 SBRSETI 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 unavoidable result of the execution of 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 SBRSETI their agent, employees or other contractors not being employed by the contractor or for 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 by the contractor, his servants or agent such part of the compensation as may be just and equitable having regard to the extent of the responsibility of the SBRSETI, their employees, or agents or other employees, or agents or other contractors for the damage or injury.

26.3 Contractor to Indemnify SBRSETI

The contractor shall indemnify the SBRSETI against all claims, proceedings, damages, costs, charges and expenses in respect of the matters referred to in the provision sub-clause 26.2 of this clause.

26.4 Contractor's Superintendence

The contractor shall fully indemnify and keep indemnified the SBRSETI 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 SBRSETI 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 there from, provided that the contractor shall not be liable to indemnify the SBRSETI 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 Architect / Consultant in this behalf.

26.5 Third Party Insurance

26.5.1 Before commencing the execution of the work the contractor but without limiting his obligations and responsibilities under clause 26.0 of GCC shall insure against his liability for any material of physical damage, loss, or injury which may occur to any property including that of SBRSETI, or to any person, including any employee of the SBRSETI, by or arising out of the execution of the works or in the carrying out of the contract, otherwise that due to the matters referred to in the provision to clause 26.0 thereof.

26.5.2 Minimum Amount of Third Party Insurance

Such insurance shall be effected with an insurer and in terms approved by the SBRSETI which approval shall not be reasonably withheld and for at least the amount stated below. The contractor shall, whenever required, produce to the Architect / Consultant the policy or policies of insurance cover and receipts for payment of the current premiums.

26.6 The minimum insurance cover for physical property, injury, and death is Rs. 5.00 lakhs per occurrence with the number of occurrences limited to four. After each occurrence contractor will pay additional premium necessarily to make insurance valid for four occurrences always.

26.6.1 Accident or injury to workman

The SBRSETI 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 SBRSETI or their agents, or employees. The contractor shall indemnify and keep indemnified SBRSETI 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.

26.6.2 Insurance against Accidents etc. to Workmen

The contractor shall insure against such liability with an insurer approved by the SBRSETI during the whole of the time that any persons are 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 SBRSETI is indemnified under the policy but the contractor shall require such sub-contractor to produce to the Architect / Consultant when such policy of insurance and the receipt for the payment of the current premium.

26.6.3 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 SBRSETI 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 SBRSETI as aforesaid from any amount due or which may become due to the contractor, or recover the same as debt from the contractor.

26.6.4 Without prejudice to the others rights of the SBRSETI against contractors. In respect of such default, the employer shall be entitled to deduct from any sums payable to the contractor the amount of any damages cost, charges, and other expenses paid by the SBRSETI 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.

27.0 Commencement of Works:

The date of commencement of the work will be reckoned as the date of handing over site or fifteen days from the date of issue of letter of acceptance of the tender by the SBRSETI whichever is later.

28.0 Time for Completion:

Time is essence of the contract and shall be strictly observed by the contractor. The entire work shall be completed within a period of **10 (Ten) calender months** from the date of commencement. If required in the contract or as directed by the Architect / Consultant. 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.

29.0 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 SBRSETI to grant a fair and reasonable extension of time for completion of work as per terms of contract. If the contractor needs an extension of time for 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 SBRSETI through the Architect / Consultant in writing at least 30 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 SBRSETI 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 SBRSETI the provision of liquidated damages, as stated under clause 9.0 shall become applicable. Further the contract shall remain in force even for the period beyond the due date of completion irrespective whether the extension is granted or not.

30.0 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 Architect / Consultant should the rate of progress of the work or any part thereof be at any time be in the opinion of the Architect / Consultant too slow to ensure the completion of the whole of the work by the prescribed time or extended time for completion of the Architect / Consultant shall thereupon take such steps as considered necessary by the Architect / Consultant to expedite progress so as to complete the work by the prescribed time or extended time. Such communications from the Architect / Consultant neither shall relieve the contractor from fulfilling obligations under the contract nor will he is entitled to raise any claims arising out of such directions.

31.0 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 Architect / Consultant, 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 Architect / Consultant. However the provisions 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 / continued with the prior approval of the Architect / Consultant at no extra cost to the SBRSETI.

All work at night after obtaining approval from competent authorities shall be carried out without unreasonable noise and disturbance.

32.0 No compensation or restrictions of work:

If at any time after acceptance of the tender SBRSETI shall decide to abandon or reduce the scope of work for any reason whatsoever and hence not required the whole or any part of the work to be carried out. The Architect / Consultant shall give notice in writing to that effect to the contractor and the contractor shall act accordingly. In the matter, the contractor shall give 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 foreclosure 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 bonafide 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 Architect / Consultant 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 SBRSETI 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 Architect / Consultant shall be final.

33.0 Suspension of Work

- (i) The contractor shall, on receipt of the order in writing of the Architect / Consultant (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 Architect / Consultant may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof for any of following reasons.
 - (a) On account 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 safety of the work or part thereof.

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

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

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

34.0 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 SBRSETI.

- (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 SBRSETI.
- (b) To employ labour paid by the SBRSETI and to supply materials to carry out the work, or any part of the work, debiting the contractor with the cost of the labour and materials (the cost of such labour and materials as worked out by the Architect / Consultant 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 rate as if it had been carried out by the contractor under the terms of this contract the certification of Architect / Consultant as 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 Architect / Consultant shall be final and conclusive) shall be borne by original contractor and may be deducted from any money due to him by SBRSETI 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 SBRSETI 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 of the performance of the contract and in case the contract shall be rescind 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 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.

35.0 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 Govt. 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 Architect / Consultant that he is able to carry out and fulfill the contract, and to give security therefore if so required by the Architect / Consultant.

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 SBRSETI through the Architect / Consultant or shall suffer any payment under this contract or any payment due to which may become due to the contractor thereunder:

- (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 SBRSETI 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 SBRSETI 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 SBRSETI's or Architect's / Consultant's instructions to the contrary subject any part of the contract. Then and in any of said cases the SBRSETI and or the Architect / Consultant, may

notwithstanding any previous waiver, after giving seven days notice in writing to the contractor, determine the contract, but without thereby affecting the powers of the SBRSETI 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.

When the works shall be completed or as soon thereafter as convenient the SBRSETI 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 SBRSETI 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 SBRSETI incidental to the sale of the materials etc.

36.0 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 SBRSETI from time to time. The SBRSETI shall recover the statutory recoveries 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 SBRSETI 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 M books.

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 SBRSETI shall pay the amount within a period of three months from 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.

37.0 Settlement of Disputes and Arbitrations

- (i) 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.

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 Asst. General Manager (LB & RRB), 3rd Floor, SBRSETI, Local Head Office, Bhubaneswar and endorse a copy of the same to the Architect, within 30 (Thirty) 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 contractor shall not be entitled to raise any claim nor shall the Bank be 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 Asst. General Manager (LB & RRB), the Secretary, SBRSETI in the manner and within the time as aforesaid.

- (ii) 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. It will also be no objection to any such appointment that the arbitrator so appointed is a Bank Officer and that he had to deal with the matters to which the contract relates in the course of his duties as Bank Officer. 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, the President of SBRSETI. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

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 disputes with amounts claimed in respect of each dispute along with the notice for appointment of arbitrator.

It is also a term of this contract that no person other than a person appointed by such Chief General Manager as aforesaid should act as arbitrator.

The conciliation and arbitration shall be conducted in accordance with the provisions of the arbitration & conciliation Act, 1996 or any statutory modification or reenactment thereof and the rules made there under.

It is also a term of contract that if any fees are payable to the arbitrator these shall be paid equally by both the parties. However, no fees will be payable to the arbitrator if he is a Bank Officer.

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 or 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 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.

38.0 Water Supply

The contractor shall make his own arrangements for 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 by of the contractor shall be fit for construction purposes to the satisfaction of the 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.

38.1 The contractor shall construct temporary well / tube well in SBRSETI land for taking water for construction purposes only after obtaining permission in writing from the SBRSETI. The contractor has to make his own arrangements for drawing and distributing the water at his own cost. He has to make 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 SBRSETI without any compensation as directed by the Architect / Consultant.

39.0 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 approval from the appropriate authorities, if required.

39.1 If, Contractor uses Water/Electricity (percent) from the source of the employer, recoveries at the rate of 1% (one percent) for water charges and 2% (two percent) for electricity consumption charges @ of Government Commercial Rate shall be effected from the running account bill of the Contractor from time to time.

40.0 Treasure Trove etc.:

Any treasure trove, coin or object antique which may be found on the site shall be the property of SBRSETI and shall be handed over to the bank immediately.

41.0 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 lay down by the Bureau of Indian Standards. In the event any dispute / disagreement the decision of the Architect / Consultant shall be final and binding on the contractor.

42.0 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 SBRSETI / Architect / Consultant whenever desired by them. The contractor shall also maintain the records / registers as required by the local authorities / Govt. from time to time.

- (i) Register for cement / paint / Lead / specific materials
- (ii) Register for steel
- (iii) Register for hindrance to work
- (iv) Site Order Book

43.0 Force Majeure

43.1 Neither contractor nor SBRSETI shall be considered in default in performance of their obligations if such performance is prevented or delayed by events such as but not to 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 each other to 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
- (x) Any other act or enactment relating thereto and rules framed there under from time to time.

45.0 Accidents

The contractor shall immediately on occurrence of any accident at our about the site or in connection with the execution of the work report such accident to the architect / consultant. The contractor shall also such report immediately to the component authority whenever such report is required to be lodged by the law and take appropriate actions thereof.

SPECIAL CONDITIONS OF CONTRACT

SCOPE OF WORK

1.0 The scope of work is to carry out the Addition & Alteration to Existing SBRSETI Building at Bolangir, Odisha

2.0 Address of Site

The site is located at Bolangir, Odisha.

3.0 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.

4.0 Notice of Operation

The contractor shall not carry out any important operation without the consent in writing from the Architect / Consultant.

5.0 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.

6.0 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.

7.0 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 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.

8.0 Temporary Roads

The contractor shall provide access road to the site from the nearest main road at no extra cost and as directed by the Architect / Consultant. The contractor shall also responsible for proper maintenance of this access road and would take all care to see that existing services, if any, are maintained in working order at his own cost. The laying and maintaining the temporary roads within the site area shall be the contractor's responsibility and the contractor shall take such measures that are necessary and as directed by the Architect / Consultant.

9.0 Water, Power and Other Facilities

- (a) 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 sink a tube well / open well and bring water by means of tankers at his own cost for the purpose. The SBRSETI will not be liable to pay any charges in connection with the above.
- (b) The rate quoted in the tender shall include the expenses for obtaining and maintaining power connections and shall pay for the consumption charges.
- (c) The contractors for other trades directly appointed by the SBRSETI 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 SBRSETI will reimburse the amount on production of receipts.**
- (d) The SBRSETI as well as the Architect / Consultant shall give all possible assistance to the contractors to obtain the requisite.
- (e) Permission from the various authorities, but the responsibility for obtaining the same in time shall be of the contractor.

10.0 Office Accommodation

- (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 form the Architect / Consultant.
- (b) A site office for the use of SBRSETI / Consultant shall be provided by the contractor at his own expenses.
- (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.

- (d) 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.

11.0 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.

12.0 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.

13.0 Fire fighting arrangements

- (i) The contractor shall provide suitable arrangement for fighting 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. These equipments shall be provided at suitable prominent and easily accessible places and shall be properly maintained.
- (ii) Any deficiency in the fire safety or unsafe conditions shall be corrected by the contractor at his own cost and to the approval of the relevant authorities. The contractor shall make the following arrangements at his own cost but not limited to the following.
 - (a) Proper handling, storage and disposal of combustible materials and waste.
 - (b) Work operations which can create fire hazards.
 - (c) Access for firefighting equipments
 - (d) Type, number and location of containers for the removal of surplus materials and rubbish.
 - (e) Type, size, number and location of fire extinguishers or other firefighting equipment.
 - (f) General housekeeping.

14.0 Site Order Book

A site order book shall be maintained at 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 contract. Each site order book shall have machine numbered pages in triplicate and shall 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.

15.0 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 off.

16.0 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.

17.0 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.

18.0 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.

19.0 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 GST, 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.

20.0 Acceptance of Tender

The SBRSETI 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 SBRSETI.

21.0 Electrical Work

The Electrical Installation work shall be carried out under the supervision of registered Electrical Contractor and licensed Electrical Supervisor duly authorized the "Electrical Licensing Board, Govt. of Orissa" to carry out Electrical Installation work to domestic and industrial installation upto 650 volts / Empanelled by State Bank of India (P&E Dept.), Local Head Office, Bhubaneswar of appropriate class. The copy of the valid License of the Electrical Contractor as above shall be submitted along with the Tender Paper. Also a letter of consent of the Electrical Contractor in writing to the effect that he will supervise the Electrical Installation work and furnish the necessary test certificate as and when required. The contractors desirous to engage electrical contractor from any of the SBI's empanelled contractor, may obtain names from Asst. General Manager, SBI, (P&E Dept.) Local Head Office, Bhubaneswar on request through Asst. General Manager (LB & RRB), SBI, 3rd Floor, Local Head Office, Bhubaneswar.

SAFETY CODE

1. First aid appliances including adequate supply of sterilized dressing and cotton wool shall be kept in a readily accessible place.
2. An injured person shall be taken to a public hospital without loss of time, in cases where the injury necessitates hospitalization.
3. Suitable and strong scaffolds should be provided for workmen for all works that cannot safely be done from the ground.
4. No portable single ladder shall be over 8 mtr. in length. The width between the side rails shall not be less than 30 cm. (clear) and the distance between two adjacent rungs shall not be more than 30 cm. when a ladder is used an extra Mazdoor shall be engaged for holding ladder.
5. The excavated material shall not be placed within 1.5 meters of the edge of the trench or half of the depth of trench whichever is more. All trenches and excavations shall be provided with necessary fencing and lighting.
6. Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be one meter.
7. No floor, no roof or other part of the structure shall be so overloaded with debris or materials as to render it unsafe.
8. Workers employed on mixing and handling material such as asphalt, cement mortar or concrete and lime mortar shall be provided with protective footwear and rubber hand-gloves.
9. Those engaged in welding works shall be provided with welder's protective eye shields and gloves.
- 10(i) No paint containing lead or lead products shall be used except in the form of paste or readymade paint.
- (ii) Suitable facemasks should be supplied for use by the workers when the paint is applied in the form of spray or surface having lead paint dry rubbed and scrapped.
11. Overalls shall be supplied by the contractor to the painters and adequate facilities shall be provided to enable the working painters to wash during the periods of cessation of work.
12. Hoisting machines and tackle used in the works, including their attachments, anchorage and supports shall be in perfect condition.
13. The ropes used in hoisting or lowering material or as a means of suspension shall be of durable quality and adequate strength and free from defects.

PROFORMA OF SITE ORDER BOOK

Name of the work _____

Date of Commencement _____

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

- | | Dated | Month | Year |
|---|--------------|--------------|-------------|
| (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

PROFORMA OF HINDERANCE REGISTER

Name of work :

Date of start of work :

Name of contractor :

Period of Completion :

Agreement No. :

Date of Completion :

Sr. No.	Nature of hindrance	Date of occurrence	Date of which hindrance	Period of hindrance	Signature	Remarks	SE/PEf
1	2	3		4	5	6	7

SE = Site Engineer

PE = Project Engineer

PROFORMA OF CONCRETE CUBE TEST

1. Name of the Project _____

2. Name of the Contractor _____

Sr. No.	Date of casting	Identification mark location in which the representative	Mix Proportion	Date of Testing	Crushing Strength as on the date	of test
1	2	3	4	5	6	

Crushing strength As on the 28 th day	Average crushing strength (average of 3 companion cubes) As on the 28h day	Remarks	Signature of the Site Engineer
7	8	9	10

PROFORMA OF CEMENT REGISTER

Name of Work

Name of Contractor

Agreement No.

Date of Receipt	Source of Receipt	Quantity received	Proressive total	Date of issue for which	Quantity issued at the end	Item of work	Quantities returned	With ref.
	To S.O./ Indent						issued of the day	

1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---

Total Issued	Daily balance At hand	Contractor's Initial	Site Engineer's Initial	initial of	Remarks Bank's engineer or Consultant
9	10	11	12		13
					14

PROFORMA OF STEEL REGISTER

Name of Work

Name of Contractor

Sl. Source of Consumption as		Steel								
No. receipt measurement										
With ref. vide M.B. No.		6mm	8mm	10mm	12mm	16mm	18mm	20mm	25m	
O.S.O. / & Page No. or										
Indent issues to										
Other works										
And their T.E.										
Nos.										
1	2	3	4	5	6	7	8	9	10	11

Total	Initial of Site Engineer	Initial of Contractor	Initial of Bank's Engineer / Consultant
12	13	14	15

PROFORMA OF SIEVE ANALYSIS OF COARSE AGGREGATE REGISTER

Sl. No.	Date of Test	Weight of materials to be Tested	Nominal Size of aggregate	I.S. Sieve designation	Standard % passing for graded Aggregarte of Nominal size	Test. Results
1	2	3	4	5	6	7

% obtained passing of Bank's	Signature of the Engineer	Signature of Contractor	Signature of Architect's representative	Remarks
8	9	10	11	12

PROFORMA OF BULKAGE TEST OF SAND

Sl. No.	Date of Test	Volume of Dust sand In Cylinder	Percentage of Bulkage Site Engineer	Signature of Contractor	Signature of Bank's / Consultant's	Signature of Representative
1	2	3	4	5	6	7

PROFORMA OF STILT TEST REGISTER

Sl. No.	Date of Test	Height of sand in Cylinder Inuadated & Stirred	Height of Silt	Max. percentage of silt as specified	Percentage of silt obtained
1	2	3	4	5	6

Signautre of Site Engineer	Signature of Contractor	Signature of Bank's / Consultant's Representative
7	8	9

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 dumpings 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 Portland Cement conforming to the latest Indian Standards IS: 269 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 Portland 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.

Course Aggregate:

Course aggregate shall be approved hard aggregate generally confirming 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.

Types of concrete, strengths etc.:

The Bill of Quantities specifies various types of concrete. The strengths corresponding to these types is as per Table below:

TYPES OF CONCRETE

Sl.No.	Type of concrete strength	Characteristic design N/Sqmm.	Target design strength N/Sqmm.
1.	M-10	10	13.8
2.	M-15	15	20.8
3.	M-20	20	27.6
4.	M-25	25	33.7
5.	M-30	30	40.0

Even though the Bill of Quantities specified various types of concrete, it is possible that the type maybe altered to suit the site conditions. The compressive strength indicated above pertains to pressure test on works test cubes 15 x 15 x 15 cm. after normal curing for 28 days. The strength of preliminary test cubes shall be as per IS 456.

The type of concrete for any particular situation or work shall be as per instructions given to the contractor by the Architect/Consultant/Owner/ Employer notwithstanding anything contained in the foregoing clauses.

Water:

Water for all concrete work shall be clean, free from deleterious matter such as oils, acids, alkalis, 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 criteria 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 colour 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.

Cubes:

The size of cubes to be prepared and tested shall be 15 x 15 x 15 cm. (6" x 6" x 6").

The number of cubes to be collected from each samples as detailed below shall be six. Three cubes each are intended for testing at 7 and 28 days respectively and determining the strength.

Cubes tested at 7 days should give a strength of not less than 70% of the corresponding strength be prepared and tested shall be 15 x 15 x 15 cm. (6" x 6" x 6").

The number of cubes to be collected from each samples as detailed below shall be six. Three cubes each are intended for testing at 7 and 28 days respectively and determining the strength.

Cubes tested at 7 days should give strength of not less than 70% of the corresponding strength structural members and also for works at various levels. It shall also be collected whenever the usual quality for a particular strength is suspect.

Preparation and Testing of Cubes:

Casting of cubes, preparation of moulds for the same, processing and curing the cubes and pressure testing the same shall be as per detailed instruction which will be issued to the contractor from Architect/Consultant/Owner/ Employer from time to time or as per relevant Indian Standard as amended up to date as directed.

Equipment modules, testing etc.

It is the entire responsibility of the contractor to prepare and get the cubes tested and provide for all material, labour, modules, equipment, facility and charges for testing etc. The contractor's rate for concrete work shall be deemed to include for these and no extra whatsoever is admissible on this account.

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 discolour the natural colour 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 centre) 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 than 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 dampor wet condition by pouring or by covering with a layer of moist sack, canvas, hession 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 coaks 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.

Mild Steel and Tor Steel Reinforcement:

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 incorporates 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 / Owner / 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 specially 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 table moulded, burnt bricks of first class 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 1st class bricks shall not be less than 80 Kg. Sq.cm. Metallic sound of brick is also a criteria for 1st class 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 metre 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 metres or square metres 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, subcracks & other defects. The surface shall be smooth & free from blemishes & discolourations.

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 boardings 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 mould 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, roundings, and mouldings 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.

Glueing 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 fastner, 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 struted 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 mouldings, roundings, 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 labour involved in all the operations described above.

Paneled Shutters:

Solid wood panels for shutter shall be pattern and size as specified. Wherever possible each panel shall be in a single width piece. But where two pieces are used, width of each panel should not be less than 12.5 cm. when made from more than one piece, the pieces shall be jointed with a continuous togued and grooved joint and glued together and reinforced with metal dewels. The grains of solid panel shall be framed into grooves to the full depth of the groove leaving in air space of 1.5mm and the faces shall be closely fitted to the sides of the grooves. Mouldings to the edge of panel openings shall be scribed at the joints. Approved sample should be kept at the site office as per direction of Architect/Consultant/ Owner/Employer.

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, roundings and mouldings 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 mitred 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 panelled 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 permit 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 labour 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 mongery 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 metre 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 metre 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 redone 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 linsed 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 colour 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 dado 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 labour 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.

1.10.1 P.V.C. FLOORING:

The P.V.C. flooring material shall conform to T.S. 3462-1966. It shall consist of a thoroughly blended composition of thermoplastic binder, filler and pigment. The thermoplastic binder shall consist substantially of one or both of the flooring (a) Vinyl chloride polymer, (b) Vinyl chloride copolymer.

The polymeric material shall be compounded with suitable plasticizer and stabiliser.

Rubber based adhesive are suitable for fixing P.V.C. flooring over concrete floors. P.V.A. based adhesive shall be used for concrete floor.

Before laying P.V.C. tiles/sheets, it is essential to ensure that the base is thoroughly dry and damp proof for new work at least 4 to 8 weeks shall be allowed for drying the sub floor under normal condition. Prior to laying the flooring shall be brought to the temperature of the area in which it is to be laid by stacking in a suitable manner within or near the laying area for a period of about 24 hours where air-conditioning is installed, the flooring shall be laid on the sub floor until the conditioning unit have been in operation for at least 7 days.

The adhesive shall be applied by using a notched trowel to the sub floor and to the back side of the P.V.C. tiles when set sufficiently for laying the adhesive will be tacky to the touch but will not mark the finger. In general the adhesive will require about half an hour for setting, it should not be left too long a period as the adhesive properties will be lost owing to dust films and other causes. It is preferable to avoid laying under high humidity condition, when the adhesive is just tack free the P.V.C. flooring tiles shall be placed in position and should be pressed from one end onwards slowly so that the air will be completely squeezed out. After laying the tiles in position it shall be pressed with suitable roller to develop proper compact with the sub floor. The tiles should be laid edge to edge so that there is minimum gap between joints. Any adhesive which may squeeze up between tiles should be wiped off immediately with a wet cloth before the adhesive hardens.

A minimum period of 24 hours shall be given after laying the flooring for developing proper bonds of the adhesive. During this period the flooring shall not be put to service. It is preferable to lay the P.V.C. flooring after completion of planting and other decorative finish work so as to avoid any accidental damage to the flooring. The thickness of the tiles should be as mentioned in the item of Bill of Quantities.

Terrazzo Flooring:

35mm average thick finished Cast-in-situ terrazzo work to floor in Ground floor with under layer 25mm thick cement concrete of 1:2:4 mix and with gray cement using chips of size up to 12mm in cement marble power mix, 2:1 (3 cement : 1 marble power by weight in proportion 4:7 (4 cement marble powder mix 7 marble chips by volume), laid in panels or in patterns with mirror polished including providing of 6mm glass strips etc.

Terrazzo work in Dado:

18mm (average thick finished Cast-in-situ Terrazzo work to Dado in Ground Floor up to 900 mm height with under layer 12mm thick cement plaster (1:3) mix using gray cement and chips size up to 12mm to match with the shade of the flooring as per the direction of the Architect/Consultant/Owner/Employer with mirror polished etc. complete.

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.

Cuddapah Stone Fixing:

Black Cuddapah stone Cladding in Ground Floor with 25mm thick Black Cuddapah stone Tiles dressed, rubbed and polished, bottom coated with neat cement slurry and fixed on 12mm thick cement mortar (1:3) mix to masonry surfaces to proper level and joints filled with cement mixed with black oxide in required proportion washed Acid Cleaned.

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 colour 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.

PVC Door Frame:

PVC Door Frame shall be made out of PVC section in an overall size of 40mm x 58mm having multi chamber cross section with a maximum wall thickness of 2.5mm + 0.3mm to miter cut at the corner and welded. The frame shall be reinforced with steel or other appropriate materials as per requirement.

1.11 WHITE WASHING:

Materials:

White wash shall be prepared from 5 parts of stone lime and 1 part of shell lime. The lime shall be dissolved in a tub with sufficient quantity of water (about 4/5 litres/kg.) lime and the whole thoroughly mixed and stirred until it attains the consistency of thin cream. The wash shall be taken out in small quantities and strained through a clean course cloth. Clean gum dissolved in hot water shall then be added in suitable proportion of 2 Kg. per cum. of lime to prevent the white wash coming off easily when rubbed. Indigo as necessary shall be mixed as per standard practice and as per direction of Engineer.

Preparation of Surface:

The surface shall be prepared removing all mortar droppings and foreign matter and thoroughly cleaned with hair or fibre brush or other means as may be ordered by the Architect/Consultant/Owner/ Employer to produce an approved lean and an even surface. All loose pieces and scales shall be scrapped off and holes cracks etc. stopped with mortar to match with the surrounding finish. The matter should be cured sufficiently.

In case where the surfaces have been previously white washed or coloured washed, the old white or colour wash shall be entirely removed and surface broomed down before the new white wash is applied. In case the old white wash cannot be removed by brooming, the surface shall be cleaned by scrapping.

Application of white wash:

On the surface so prepared, the white wash shall be laid on with a brush, shall be from top downwards, another from bottom upwards over the first stroke and similarly one stroke from the right and another from the left over the first brush before it dries. This will form one coat. Each coat must be allowed to dry and shall be subject to inspection and approval before the next coat is applied. When dry, the surface shall show no signs of cracking. It shall present a smooth and uniform finish free from brush marks and it should not come off easily when rubbed with a finger, minimum 3 coats of white wash shall be applied or as directed by the Engineer.

No portions in the surface shall be left out initially to be patched up later on.

For new work, the white washed surface shall present a smooth and uniform finish. Doors, windows, floors and other articles of furniture etc. shall be protected from being splashed upon. Splashing and droppings, if any, shall be removed and the surfaces cleaned.

Apart from other factors mentioned elsewhere in this contract, the rates for white wash shall include for the following.

- All labour, materials, equipment required for white washing.
- Scaffolding including erection and removal
- Providing and preparing the white wash

- Preparing the surface for white wash including the scaffolding

Applying the white wash in three coats minimum if a proper even surface is not obtained to the satisfaction of Architect/Consultant/Owner/Employer in 3 coats contractor shall carry out additional coats of white wash to approval, at contractor's expense.

1.12 LIME PUNNING:

Mortar:

The mortar or punning shall consist of 2 shell lime : 1 Stone lime unless otherwise described in the item.

Application:

The surface of the under coat on which the punning is to be done shall be left rough. The punning shall be applied, when the under coat is still green. The mortar for punning shall be applied in a uniform layer slightly more than 3mm thick between gauged pads, with which to ensure an even and uniform thick surface by frequent checking with a wooden straight edge. It shall be finished to an even and smooth surface with trowels.

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

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

Thickness:

The thickness of the finished punning shall not be less than 3mm thick.

Curing shall be started as soon as the punning has sufficiently hardened not to be damaged when watered, and in any case not earlier than 24 hours after the punning has been completed. The punning shall be kept wet for a period of at least 7 days. During this period, it shall be suitably protected from all damages at the contractor's expense by such means as 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.

Measurement:

The measurements for lime punning shall be taken over the finished work. The length and breadth shall be measured correct to a cm. The area shall be calculated in Sqm. correct to two places of decimal.

Punning over plaster on bands, skirting, coving, cornices, drip courses string courses etc. shall not be measured separately but only as wall surfaces. In these cases the measurements shall be taken girthed over the above feature.

Punning over plaster on circular work also, of any radius shall be measured only as wall surfaces, and not separately.

Lime punning in patch repairs irrespective of the size of the patch Shall be measured as new work, and in this case the rate shall include for cutting the patch to rectangular shape before lime punning.

Rate:

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

1.13 OIL EMULSION (OIL BOUND) DISTEMPERING:

Materials:

Oil emulsion (Oil Bound distemper (IS-428-1969) of approved brand and manufacture shall be used. The primer where used as on new work shall be cement primer or distemper primer as described in the item. These shall be of the same manufacturer as distemper. The distemper shall be diluted with water or any other prescribed thinner in a manner recommended by the manufacturer. Only sufficient quantity of distemper required for days work shall be prepared.

The distemper and primer shall be brought by the contractor in sealed tins in sufficient quantities at a time to suffice for a fortnight's work, and the same shall be kept in the joint custody of the contractor and Architect/Consultant/Owner/Employer. The empty tins shall not be removed from the site of work, till this item of work has been completed and passed by Architect/Consultant/Owner/ Employer.

Preparation of the Surface:

For new work the surface shall be thoroughly cleaned of dust, old white or colour wash by washing and scrubbing. The surface shall then be allowed to dry for at least 48 hours. It shall then be sand papered to give a smooth and even surface. Unevenness shall be made good by applying putty, made of plaster of paris mixed with water on the entire surface including filling up the undulation and then sand papering the same after it is dry.

In the case of old work, all loose pieces and scales shall be removed by sand papering. The surface shall be cleaned of all grease, dirt, etc.

Pitting in plaster shall be made good with plaster of paris mixed with the colour to be used. The surface shall then be rubbed down again with a fine grade sand paper and made smooth. A coat of the distemper shall be applied over the patches. The patched surface shall be allowed to dry thoroughly before the regular coat of distemper is applied.

Application:

Priming Coat - The priming coat shall be with distemper primer or cement primer as required in the description of the item.

Note:

If the wall surface plaster has not dried completely cement primer shall be applied before distempering the walls. But if the distempering is done after the wall surface is dried completely, distemper primer shall be applied.

Oil bound distemper is not recommended to be applied, within six months of the completion of wall plaster.

For old work no primer coat is necessary.

Distemper coat - For new work, after the primer coat has dried for at least 48 hours, the surface shall be lightly sand papered to make it smooth for receiving the distemper, taking care not to rub out the priming coat. All loose parties shall be dusted off after rubbing. One coat of distemper properly diluted with thinner (water or other liquid as stipulated by the manufacturer) shall be applied with brushes in horizontal strokes followed immediately by vertical ones which together constitute one coat.

The subsequent coats shall be applied in the same way two or more coats of distemper as are found necessary shall be applied over the primer coat to obtain an even shade.

A time interval of at least 24 hours shall be allowed between consecutive coats to permit of the proper drying of the proceeding coat.

For old work the distemper shall be applied over the prepared surface in the same manner as in new work. One or more coats of distemper as are found necessary shall be applied to obtain an even and uniform shade.

15cm. double bristled distemper brushes shall be used. After each day's work, brushes shall be thoroughly washed in hot water with soap solution and hung down to dry. Old brushes which are dirty and caked with distemper shall not be used on 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 alkalies 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 colour 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.

1.15 CEMENT PAINT:**Materials:**

The cement paint shall be (conforming to IS: 5400 1968) of approved brand and manufacture.

Preparation of Surface:

For new work, the surface shall be thoroughly cleaned of all mortar dropping, dirt, dust, leaned of all dirt, dust, algae, oil etc. by brushing and washing. Pitting in plaster shall be made good and a coat of water proof cement paint shall be applied over patches after wetting them thoroughly.

Preparation of mix:

Cement paint shall be mixed in such quantities as can be used up within an hour of its mixing as otherwise the mixture will set and thicken, affecting flow and finish.

Cement paint shall be mixed with water in two stages. The first stage shall comprise of 2 parts of cement paint and one part of water stirred thoroughly and allowed to stand for 5 minutes. Care shall be taken to add the cement paint gradually to the water and not vice versa. The second stage shall comprise of adding further one part of water to the mix and stirring thoroughly to obtain a liquid of workable and uniform consistency. In all cases the manufacturer's instructions shall be followed meticulously.

The lids of cement paint drums shall be kept tightly closed when not in use, as by exposure to atmosphere the cement paint rapidly becomes air set due to its hygroscopic quantities.

Application:

The solution shall be applied on the clean and wetted surface with brushes or spraying machine. The solution shall be kept well stirred during the period of application. It shall be applied on the surface which is on the shady side of the building so that the direct heat of the sun on the surface is avoided. The method of application of cement paint shall be as per manufacturer's specification. The completed surface shall be watered after the day's work.

The second coat shall be applied after the first coat has been set for at least 24 hours. Before application of the second or subsequent coats the surface of the previous coat shall not be wetted.

For new work, the surface shall be treated with three or more coats of water proof cement paint as found necessary to get a uniform shade.

For old work, the treatment shall be with one or more coats as found necessary to get a uniform shade.

Precaution:

Water cement paint shall not be applied on surfaces already treated with white wash, colour wash, distemper dry or oil bound, varnishes, paints, etc. It shall not be applied on gypsum, wood and metal surfaces.

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 bushing lightly in a direction at right angles to the same. In this process, no brush markets 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 ovr 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 linsed 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 on 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 satisfactory, 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 separate. 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) Aluminium Paint - Aluminium 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 aluminium 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 Preservative:

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 (th 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 stitic 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 maternal (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 safely 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 mitres. 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 mitred to provide a snug fit. The length of mitre shall be 20 cm. width equal to the width of the corrugation. Mitring 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 galvanised 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 accessories also as the urges and also through one of the two intermediate corrugations on each sheet. When the sheets are supported one intermediate purlins 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. tunners/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" bitumatic jointing compound shall be placed on both sides of the union clip, 1.25cm. inside from the edge along its inner cutout.

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 metres 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 metres.

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.

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 SQUATTING 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 non-absorbable 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 colour unless otherwise specified.

4.0 FLUSHING :

The flushing of the squatting and pedestal W.C. pan shall be done by low level valveless 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 adaptus. 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 heamp.

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 minimum height of 191 cm. and a low level cistern within 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 litres 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, litres with tolerance of +/-0.5 liter and 15 litres 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, colour or white with the best quality fittings including brackets, as specified.

7.2 CAPACITY OF CISTERN AND THE SIZE OF FLUSH PIPE FOR FLAT BACK (BOWL) URINAL.

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

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Number of urinals of range		Capacity of flushing cistern.	Size of pipe Main Distribution.
1	5 liters	20 mm	15 mm.
2	10 liters	20 mm	15 mm
3	10 liters	25 mm	15 mm
4	15 liters	25 mm.	15 mm.

-
The joint between the urinal basin in flush and waste pipe shall be made by means of putty of white lead mixed with chopped hemp, or as specified in case of PVC pipe.

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	20 mm.
2	10 liters	25 mm	20 mm
3	15 liters	32 mm	20 mm
4	15 liters	32 mm	20 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 coloured 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 wall 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

antisiphon 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 joints etc. complete in all respect 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 of requisite strength embedded or fixed in position by means of wooden cleats and screws. The brackets shall be painted to required shade including a coat 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 trap/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 or 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 (coloured or white) of approved make. The size of the shelf shall be as specified. The shelf shall have C.P. brass or aluminium guard rail with rubber washers on positions resting on glass plate and C.P. brass or aluminium brackets which shall be fixed with C.P. brass or aluminium screws to wooden plugs firmly embedded on the wall.

10.3 TOWEL RAIL.

The towel rail shall be of C.P. brass or aluminium with two C.P. brass or aluminium brackets. The size of the rail shall be as specified. The bracket shall be fixed by means of C.P. brass or aluminium screws to wooden cleats firmly embedded in the wall.

10.4 CHROMIUM PLATED STOP COCK, TAPS, BIB COCKS, SHOWER SET, GUNMETAL 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 are 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.

SPECIFICATION FOR WATER SUPPLY PIPES & FITTINGS

All Pipes & Fittings shall manufactured using virgin CPVC compounds with cell class 23447B as defined by ASTM D1784.

BASIC PHYSICAL PROPERTIES:-

PROPERTY	TEST	CONDITION	ENGLISH UNITS	SI UNITS
GENERAL				
-Specific Gravity	ASTM D792	73°F/ 23°C	1.55	1.55
-Water Absorption	ASTM D 570	73°F/ 23°C 212°F/100°C	+0.03% +0.55%	+0.03% +0.55%
-Rockwell Hardness	ASTM D785	73°F/23°C	119	
MECHANICAL				
-Tensile Strength	ASTM D 638	73°F/23°C	8000 psi	55 N/mm ²
-Tensile Modulus	ASTM D 638	73°F/23°C	360,000 psi	2500 N/mm ²
-Compressive Modulus	ASTM D 638	73°F/23°C	10,100 psi	70 N/mm ²
THERMAL				
-Coefficient of Thermal Expansion	ASTM D 695	3.4x10 ⁻⁵ in/in/°F	6.1x10 ⁻⁵	⁵ m/m/k
-Thermal Conductivity	ASTM C177		0.9BTU in/hr/ft ² /°F	0.14 Wm/k/m ²
-Heat Distortion Temperature	ASTM D648		217°F	103°C
FLAMMABILITY				
-Flame Spread	ASTM E84			15
-Smoke Developed	ASTM E84			70-125
-Limiting Oxygen Index	ASTM D2863			60%

STANDARDS :-

Following Standards Shall be followed

(a)Copper tube size (CTS) in SDR-II & SDR-13.5

Sizes : 1/2", 3/4", 1", 1-1/4", 1-1/2" & 2"

Pipes & Fitting Standard : ASTM D 2846

Solvent Cement Standard : ASTM F 493

(b)Iron Pipe Size (IPS) in SCH 40 & 80

Sizes : 2-1-2", 3", 4", & 6"

Pipes & Fitting Standard : ASTM F 441

Fittings SCH 80 : ASTM F 439

Primer / Solvent Cement : ASTM F 656 & ASTM F 493

Recommended Horizontal Support Spacing (Distance between pipe clamps)

Nominal Pipes Sizes		23C		38C		60C		82C	
inch	mm	Ft.	Mt.	Ft.	Mt.	Ft.	Mt.	Ft.	Mt.
1/2	15	4.0	1.22	4.0	1.22	3.5	1.07	3	0.92
3/4	20	5.0	1.53	4.5	1.37	4.0	1.22	3	0.92
1	25	5.5	1.68	5.0	1.53	4.5	1.37	3	0.92
1-1/4	32	6.0	1.83	5.5	1.68	5.0	1.53	4	1.22
1-1/2	40	6.5	1.98	6.0	1.83	5.5	1.68	4	1.22
2	50	7.5	2.29	7.0	2.14	6.5	1.98	4	1.22

Note : Vertical CPVC piping should be supported at each floor and should have a mid-story guide, unless thermal expansion design calls for other provision.

Pressure Testing: Pressure testing shall be conducted after installation.

Once an installation is completed, it shall be provided adequate time to cure before undertaking pressure testing or use refer to the below mentioned cure timetables.

Jointing Procedure.

1. Cut pipe straight (very important). This will allow pipe to bottom into the socket.
2. Remove burr (shaving), use clean dry cloth or knife. Do not use abrasive materials.
3. Clean pipe and fitting & ensure no dirt, grease or any other foreign matter.
4. Check dry fit. Pipe should easily go into the socket 1/3 to 2/3 of the way before any resistance is felt.

This is commonly referred to as interference fit. If pipe goes to the bottom of the fitting without any resistance (interference) ensure fitting is correct size. If it is not correct size get another fitting.

5. Apply a thin coat of cement into the fittings socket and a full even coat on the pipe to the depth of socket bottom. Do not puddle cement in socket.
6. Insert pipe into the socket quickly while cement is still fluid (wet), if cement has dried, re-coat pipe and fitting. Twist pipe turn, this will allow cement to cover any dry spot. Make sure pipe goes all the way to the bottom of the fitting.
7. Hold pipe and fitting together (30 second) to make sure pipe does not push out.
8. Wipe off excess cement with clean dry cloth.
9. Allow cement to cure before applying water (fluid) pressure. Cure time is dependent upon temperature, humidity etc however under normal conditions, allow 24 hours cure time.

STANDARDS AND CODE COMPLIANCE

BIS 157778 : 2007

ASTM D 2846/F493

TECHNICAL DETAILS

Outside Diameter and Wall Thickness for CPVC 4120, SDR II & SDR 13.5 Plastic Pipe.

Nominal Sizes		Avg. OD MM		Tolerance	Min. Wall Thickness MM		Tolerance
inch	mm	SDR II	SDR 13.5	MM	SDR II	SDR 13.5	MM.
1/2	15	15.90	15.90	+/-0.08	1.73	1.40	+0.51
3/4	20	22.20	22.20	+/-0.08	2.03	1.65	+0.51
1"	25	28.60	28.60	+/-0.08	2.59	2.12	+0.51
1-1/4"	32	34.90	34.90	+/-0.08	3.18	2.59	+0.51
1-1/2"	40	41.30	41.30	+/-0.10	3.76	3.06	+0.51
2"	50	54.00	54.00	+/-0.10	4.90	4.00	+0.58

CPVC 4120 CTS SDR II Pipe Pressure Rating vs Temperature Table

Operating Temperature	Working Pressure Rating (kg/cm ²)	
	SDR II	SDR 13.5
	1/2", 3/4", 1", 1 1/4", 1 1/2", 2"	1/2", 3/4", 1", 1 1/4", 1 1/2", 2"
23°C	28.10	22.50
27°C	28.10	22.50
32°C	25.57	20.48
38°C	23.05	18.45
43°C	21.64	17.33
49°C	18.27	14.63
54°C	17.42	13.95
60°C	14.05	11.25
66°C	13.21	10.58

71°C	11.24	9.00
77°C	8.99	7.20
82°C	7.03	5.63
93°C	5.62	4.50

Approximate Number Of Joints that Can Be Made With One Fusion Compound (Solvent Cement) Can

Nominal Sizes	Inch	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
		MM	15	20	25	32	40
Approx. Number of joints Per Can	50 ml	35	23	15	14	10	07
	118 ml	82	55	34	33	23	17
	237 ml	164	110	68	66	46	34
	473 ml	328	220	136	132	92	68
	946 ml	656	440	272	264	184	136

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	Soil Waste & Vent Pipes I.S. 1729-1964	
		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 lead. 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 labour 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 and 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 can not 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

Tarred 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 filed, 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 scrapper. 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 around 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 down stream pipe line shall be filled too with water to avoid the difficulty of removing the stopper form 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 upto 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.

TECHNICAL SPECIFICATION OF ELECTRICAL INSTALLATION

ABBREVIATIONS

Millimeter	mm
Meter	M.
Square Millimeter	Sq. mm.
Cubic Meter	Cum.
Kilogram	Kg.
Volts	V
Amps	A
Kilowatt	Kw.
Triple Pole	T.P.
Double Pole	D.P.
Single Pole	S.P.
Neutral	N
Distribution Board	D.B.
Teak Wood	T.W.
Branch Distribution Board	B.D.B.
Fluorescent Lamp	F.L.
Power Factor	P.F.
Standard Wire Gauge	S.W.G.
Bureau of Indian Standard	B.I.S.
Rupees	Rs.
Paise	P
Live Side	L.S.
Neutral Linked	N.L.

SUMMARY OF ELECTRICAL INSTALLATION

1. The Builder will be required to carry out the complete electric installations and get the same connected by the Supply Company and hand over the same in complete working order.
2. The work will be carried out only in accordance with the prevalent rules and regulations of the Indian Electricity Act.
3. The fittings such as plugs, switch, cut-outs, ceiling roses and other electric appliances must be shock proof.
4. The internal wiring shall be copper conductor P.V.C. insulated and PVC sheet 250 volts wire.
5. The mains would run in 25 mm dia. Heavy PVC conduit pipe to all the floors with copper conductor, P.V.C. insulated or heavy make fixed with saddles and gatties (wooden) pegs) along with 14 SWG copper earth wire.
6. Power wiring will be 3/20 copper conductor, P.V.C. insulated and PVC sheeted wire.
7. All the electrical installations work will be carried out according to the electrical lay-out / drawing showing light points, fan point, plugs, etc. and no changes shall be made without consulting the Architect.
8. All the accessories such as switch, holder, plug, socket, ceiling roses etc. shall be standard.
9. All T.W. folding blocks for central switches and regulations inside the flats will be varnished.
10. All switches, plugs for lighting and domestic will be good quality piano type standard make and it will be fixed with Iron screws.
11. Mains in the staircase should be concealed. Lights point one in each staircase shall be in conduit and concealed along with 14 SWG copper earth wire.
12. There shall be a teakwood cupboard for housing meters and main switches on the ground floor in the stair case entrance. The shutter should have three coats of oil pain with the side and back surface of shutter shall be painted with three coats of oil pain, with provisions of good ventilation and locking.
13. All deposits also including meter charges and deposits if any will be paid by the Bank.
14. All the electrical work shall be of open type in copper wiring.
15. All metal parts shall be effectively earthed. Earthing conduction shall be of copper Bars of No. 14 SWG for lighting. The excavation for earth place shall be made to a depth of not less than 6' and shall not be close to foundations of building. Earth pits to be provided and finished as per ISI specifications.

INTERNAL ELECTRICAL WORK

1. The installation shall generally be carried out in conformity with the requirement of the Indian Electricity Act, 1910 as amended upto date and the Indian Electricity Act, 1956 framed there under, the relevant regulations of the Electric Supply Authority concerned and also with the specifications laid down in the Indian Standard I.S. 732-1963 code of practice (revised) for Electrical wiring installations (system voltage not exceeding 658 volts) and I.S. 2309-1969 code of practice for the protection of Buildings and Allied structures against lightning. The wiring shall also be according to the specifications of OSEB, Govt. of Orissa.

2. **MATERIALS**

All materials fittings appliances, used in electrical Installations, shall conform to Indian Standard Specifications wherever these exist. A list of approved materials is attached afterwards. Materials not included in the list shall be got approved by Architects / Consultants / Employer prior to actual use.

3. **MAIN SWITCH GEAR**

Iron clad switch fuse and isolator units should conform to B.S. 861 (I.S. 2510-1954) and the quick make and break mechanism shall be self inter-locked with the cover. In "off" position there must be two breaks pr pole. Main Switch gear shall be properly earthed with two number 6 SWG G.I. wire if M.V. and one number 6 SWG G.I. wire if L.G.

4. **BUSBAR CHAMBER (B.B.C)**

This shall be totally enclosed, metal clad type fabricated from rust proofed 14 S.W.G. sheet steel on angle iron frame and provided with sheet steel or cast iron cover and undrilled detachable and plates suitable for mounting on wall or 1 angle detachable and plates suitable for mounting on wall or 1 angle 1 from floor stand and painted with high quality stove enamel paint G.I. bolts and nuts shall be used for assembly with suitable packing materials to ensure dust proof finish. Meters shall be provided on suitable sheet steel boxes. Switches shall be provided with cable and boxes as required.

The depth of R.B.C. shall be 150 mm.(minimum). Minimum clearance of phase bars to earth shall be 20 mm. and between bus bars shall be minimum 25 mm.

H.C. (high conductivity) copper bus bar properly tinned / chromium plates, are to be rated at 100 Amps per Sq. in and Aluminum bus bars (wrought aluminum alloy strip) conforming to relevant I.S. specification at 800 Amps per Sq. in Neutral bus bars are to be rates to carry 60% of phase current. These shall be carried on glazed porcelain supports of proper dielectric and mechanical strength and shall be appropriately colour coded for identification of phase.

Lettering shall be done for identification of switches as directed. The contractor shall submit fully dimensioned drawing of the board with the physical position of the switches and other components to the Architects for their approval before the same is fabricated.

There shall be two nos. of Earth terminals, suitable Danger Board & Shock Treatment Chart shall be provided.

5. **ITER-CONNECTION BETWEEN B.B.C. & SWITCH FUSES, METERS.**

For rating above 150 A, these shall consist of copper strips of adequate section. For rating below 150 A PVC cable tails of appropriate size, terminating in tinned copper sockets may be used. The above are to be enclosed either in sheet metal trunking or conduits so that no part is exposed.

6. **DISTRIBUTION**

These are to be totally enclosed metal clad type Distribution Board with hinged lids shall be in accordance with I.S. 2147-1952 and 25675-1966 and B.S. 214 and shall be of welded construction and fabricated from rust proofed sheet and finished with anti-corrosive stove enamel paint and have provision for fixing on wall and have earthing terminal / terminals.

Power distribution Boards (400 volts TPN) shall be constructed from 14 SWG sheet steel and Branch Distribution Boards (230 volts SPN) from 16 SWG sheet steel.

The minimum ratings of phase and neutral bus bars shall be 67% of the total rating of fuse ways. Above 32 neutral Bus Bars may be half the size of the phase Bus Bars.

The fuses shall be mounted on glazed procleain supports of proper dielectric & Mechanical strength. TPN units should have phase separating barriers between fuse banks.

Cables shall be connected to a terminal only by soldered / crimped lugs, unless the terminals are of such a form that they can be securely clamped without cutting away of cable strands.

Where two or more B.D.B.s feeding low voltage circuits are feed from different phase of a medium voltage supply, these B.D.Bs shall be installed at least two meters apart.

All three phase power distribution boards shall be properly earthed with two number 10 SWG galvanized iron wires and provided with suitable danger board. All B.D.Bs shall be properly earthed with one number 10 SWG galvanized iron wire each.

7. **SWITCHES**

All switches for lights, fans and plug points shall be plate type made out of I.S.I. grade urea formaldehyde moulding powder in various combination plates with solid state electronic regulator, unless specified otherwise.

8. **CABLES AND CONDUCTORS**

All cables shall conform to relevant Indian Standard. Conductors of all cables except for flexible cables, shall be of aluminum, unless specified otherwise. All wires shall be PVC insulated and PVC sheathed unless specified otherwise.

9. **FLEXIBLE CABLES**

Conductors of flexible cables shall be of copper. The minimum size of core acceptable is 0.50 Sqmm (16/0.20 mm). The maximum weight to which the following twin flexible cords may be subjected are as follows:-

Twin 16/0.20 mm.	-	3.3 lbs (1.5 Kg.)
Twin 23/0.0076 inch	-	5.0 lbs (2.3 Kg.)

10. **INSTALLATION OF MAIN SWITCH BOARDS, B.D.B.'S MAIN, SUB-MAIN, DISTRIBUTION WIRING TO INDIVIDUAL POINTS.**

The exact positions of all main switch board, B.D.B.'s and all runs of mains and sub-mains, and distribution wirings to individual points including the exact position of of all light fittings and switch board shall be first marked on the buildings and shall be approved before actual commencement of work.

The B.D.B.s shall generally be installed at a height of 2.13 mtr. (7' from floor level)

11. **INSTALLATION OF SWITCH BOARDS**

These shall be installed at a height of 1.3 mtr. (4' -3") above the floor level.

12. **INSTALLATION OF CEILING FANS**

Unless otherwise specified all ceiling fans shall be hung not less than 2.75 M (9 ft to above floor. The suspension rod and clamps shall be painted with approved paint without involving extra cost.)

13. **INSTALLATION OF FLUROSCENT LIGHT FITTINGS :**

Where these are suspended from ceiling by two down rods each fixing to the ceiling shall be capable of sustaining at least 11 kg. of dead weight.

The down rods and access rise shall be painted with approved paint without involving extra cost.

Unless otherwise specified these should be suspended 2.60 M (8' – 6") above the floor.

14. **INSTALLATION OF EXHAUSE FANS**

Exhaust Fans shall be fitted by mans of rag bolts embedded in the wall. The re3quired holes in the wall shall be made and finished nearly with cement plaster and brought to the original finished of the wall.

15. **INSTALLATION OF SOCKET OUTLETS**

No socket outlet shall be provided in the bath room at a height less than 130 cms (4' – 3") from the floor. No switches shall be provided inside the bath rooms. Socket outlets at othe locations than bath rooms shall be wither 25 cms (10") or 130 cms. (4" – 3") from the floor.

16. INSTALLATION OF ELECTRIC MOTORS

Electric Motors shall be earthed with 2 nos. WG 10 G.I. wires if M.V. and 1 no. of L.V.

17. TESTING OF INSTALLATION

Before a completed installation or an addition to an existing installation is put into service, the following tests shall be carried out by the contractor in presence of the Owner / Architects / Consultants)

(a) POLARITY OF SWITCHES

It must be ensured by test that all single pole switches have been fitted on the live side of the circuits they control.

(b) INSULATION TEST

(i) By applying a 500 volt Meter between earth and the whole system of conductors or any section thereof with all fuses in places and all switches closed, all lamps in position or both poles of installation otherwise electrically connected together. The result shall not be less than 50 divided by the number of points on the circuit and need not be more than a megohm.

(ii) Between all conductors connected to one phase and all conductors connected to the neutral or to the other phase conductors of the supply after removing all metallic connections between the two poles of the installation and switching on all switches. The insulation resistance shall be as in (i) above.

(c) EARTH CONTINUITY TEST

The earth continuity conductor including metal conduits, and metal sheaths of cables in all cases shall be tested for electrical continuity. Electrical resistance of the above with the earthing lead but excluding any resistance of earth leakage circuit breaker, measured from the connection with the earth elected to any point in the earth continuity conductor in the completed installation shall not exceed one ohm.

(d) EARTH RESISTANCE TEST

To ensure effectiveness of installation Earth, the value of earth resistance shall be within 4 ohm. for installations of higher capacity.

The completed work will be taken over only if the results obtained in above tests are within the limits mentioned above, and in accordance with I.E.E. Rules.

On completion of the installation work, a certificate shall be furnished by the contractor, countersigned by the certified supervisor under whose direct supervision the installation was carried out. This certificate shall be in a prescribed form as required by the local Electrical Supply Authority.

SPECIAL SPECIFICATIONS

- (a) All switches, fittings etc. should be produced before Engineer-in-charge of Owner / Architects / Consultants and got approved before fixing.
- (b) All metal switch boards and switch / regulator boxes to be used in work shall be painted with two coats of anti rust primer (red oxide paint) prior to erection. After erection they will be again painted with two coats of enamel paint of approved quality.
- (c) Before any portion of circuit work for wiring is taken over in hand, a neat proper lay-out should be made out by the contractor and got approved from the Engineer-in-charge of Owner / Architects / Consultants. For this purpose contractor is advised to get acquainted with the layout drawing of the consultants.
- (d) While laying the conduits for concealed wiring in the ceiling or in the beams & columns and before casting the contractor must ensure that all the inlets and both ends of the conduits are plugged by means of dead end socket so that any foreign matter cannot enter the conduits and choke them.
- (e) Damage to any fitting during erection and before handing over the installation by contractor shall be set right or replaced by the contractor at his own cost.
- (f) Caution Board or proper size wherever required, shall be provided, as per I.E.E. regulations for which no extra payment will be admissible.
- (g) Any repairs done to wall etc. should match with the surrounding surface otherwise same will be got done throughout building contractor at the cost of the Electrical Contractor.
- (h) Earthing shall be done in the presence of Engineer-in-charge of Owner or his representative.
- (i) I.C. switches and Distribution Fuse Boards shall be provided with neat lettering in block letters with paint for identification of the I.C. switches and for the points connected to each fuse way of the D.S. for which no extra payment will be admissible.

(j) **COMPLETION DRAWING**

The contractor shall be required to submit within 2 months from the date of completion of work, the undernoted drawings on tracing cloth:-

- (i) Plan (as per structural drawing) of each floor (not less than 8 ft. = 1 inch or 1 : 100 metric scale) showing : position of lights, fans and wall sockets, other consuming devices, together with type of fittings and fixtures, circuits with phase identification marks, and location of switches B.D.B. with number of ways. Position of Earthing stations for light & power. Position of lighting conductors, Earthing, Stations and route of running conductors.
- (ii) Information on the plans
 - (a) Name of work with job No.
 - (b) Accepted Tender No.
 - (c) Date of Completion
 - (d) Name of Place
 - (e) Name and signature of contractor
 - (f) Scale of drawing

2. (a) Lay-out and connections of Main and Sub-board, BDB having descriptions of the size, capacity, type & their numbers, the system and sources of supply.
- (b) Location, size, type, length of main and sub-main cables.
- (c) Loading of each B.D.B. indication of phases, Departmental mark on each B.D.B. and switch gear.

The drawings shall be very neatly drawn and submitted properly without folding them.

3. Cable route shall be marked on site plan with measurements from permanent structure.

1. **WIRING ON TEAK WOOD BATTEN**

T.W.Batten:-

Teak wood battens or best quality hard wood battens for use must be well seasoned, perfectly straight, or minimum finished thickness of 13 mm and suitable wide to accommodate all the cables laid on the battens. These are to be varnished on all four sides with two coats of varnished of approved quality to I.D. 347-1952, the second being applied after the first has dried. The varnished batten shall be fixed to the walls and ceilings by flat head 37 mm no. 8 counter sunk iron screws driven into wood plugs or rawl-plugs or phil-plug, at an interval not exceeding 60 cm for vertical run and 45 cm for horizontal run, generally after lime punning work has been completed.

2. **T.W. BENDS CORNERS, ROUNDS**

All such materials shall be of same thickness as that of the batten and shall be individually secured at the end of the main batten.

3. **SWITCH BOARD AND REGULATOR BOARDS**

These shall be "Double Board" unless otherwise specified. Minimum thickness of bottom plank shall be 13 mm and the top laid shall be 10 mm in thickness and made from first class well seasoned teak wood and shall be highly polished when finished. Overall size shall be suitable to accommodate all switches for fans and lights and fan regulators that are to be controlled from the board including socket outlets. No. loop wiring inside the board is permissible. The back of such board shall be painted with two coats of black anti-corrosive paint.

4. **CONNECTOR BOXES, JOIN BOXES**

Minimum size of the box shall be 6" x 4" and the bottom piece shall be of minimum 15 mm thickness. A groove 3 mm wide and 3 mm deep shall be cut all round the surface against which the cover will rest. The groove shall be filled with approved plastic compound before screwing with cover shall be painted with two coats of approved type varnished both inside and outside, the second coat boxes shall be painted with two coats of black anti-corrosive paint.

5. **LINK CLIPS**

24 SWG aluminum link clips of width not less than 8 mm shall be used with rust resisting pins spaced at intervals of 10 cm. Single link clips shall not be used to hold more than two twin core PVC cable upto 1.5 Sqmm or one twin cable above 1.5 Sqmm. Care shall be taken to avoid hammering on link clips with any metal instrument after the cables are laid.

6. **CONNECTORS**

Glazed porcelain single way connectors are to be used.

7. **PROTECTION OF CABLES FROM MECHANICAL DAMAGES**

Wiring shall be drawn through a conduit protection pipe where there are chances of any damage to the wiring. Such protective covering in all cases is to be provided on all down drops within 1.5 Mtr. (5") from the floor.

8. **BEND IN WIRING**

Sharpest possible bending radius allowed is six times the overall diameters of the cable.

9. **PASSING THROUGH WALLS**

Minimum size of 19 mm (internal dia) alkathene pipe may be used to give protection and provide passage without twist or cross, for cables passing through walls. Cables must not come in direction contact with the wall.

10. **EARTHING CONTINUITY CONDUCTORS**

All three pi 5 Amp. Socket outlet points and metallic fan regulator covers shall be provided with earthing attachment by 14 SWG G.I. wires & three pin 15 Amp. Socket-outlet points with 14 SWG G.I. wires respectively.

11. **PAINTING**

Entire length of PVC insulated and sheathed wire shall after erection be painted with two coats of synthetic enamel paint of quick drying type.

CONDUIT WIRING SYSTEM

1. **TYPE AND SIZE OF CONDUIT**

All conduit pipes shall be screwed type, solid drawn or welded with black stove enameled surface and thickness of 16 SWG for sizes upto 32 mm dia and 14 SWG for sizes above 32 mm dia. The conduits are to be free from burrs and internal roughness. No conduits less than 19mm in dia shall be used, unless specified. All the conduits shall be ISI marked.

2. **ACCESSORIES**

Only screwed type of accessories are to be used.

3. **CONDUIT JOINTS**

The conduits shall be properly earthed. In long distance straight runs of conduit either inspection type screwed couplers are to be provided at reasonable intervals on running threads with couplers and jamnuts. Threads on conduit pipes in all cases shall be between 13 mm to 27 mm long-sufficient to accommodate pipes to full threaded portion of couplers or accessories. Cut end of conduit pipes shall have not sharp edges or any burrs left to avoid damage to insulation of conductor while pulling them through such pipes.

4. **PROTECTION AGAINST DAMPNES AND RUST**

In order to minimize condensation and sweating inside the tube, all outlets of piles system shall be properly drained and ventilated, but in such a manner as to prevent entry to inspect inside the conduit.

To protect against rust the outer surface of the conduit and accessories shall be painted and the bare thread portion is to be painted with anti-corrosive preservative.

5. **FIXING OF CONDUITS**

Conduit pipes shall be fixed by heavy gauge saddles and T.W. or metal bars, secured to wall / ceiling by screws driven into wood plugs or rawl plugs or phi-plugs at an interval of not more than 76 cm apart for vertical run and 60 cm apart for horizontal run but on either side of couplers or bend or similar fittings – saddle shall be fixed at distance of 30 cm from the center of such fittings. The minimum thickness for saddles shall be 24 SWG, for conduits upto 25 mm dia.

6. **BEND IN CONDUITS**

All necessary bends in the system including diversion shall be done by bending the pipes, or by inserting suitable inspection type bends elbows or similar fittings, or by fixing cast iron inspection boxes whichever is most suitable.

CONCEALED CONDUIT WIRING SYSTEM

1. **GENERAL**

Concealed conduit wiring systems shall comply with all requirements for surface conduit wiring systems as specified above and in addition conform to the requirements specified below:-

2. **MAKING OF CHASE**

The chase in the wall shall be neatly made and be of ample dimensions to permit the conduit to be fixed in the manner desired, size of chase for 19 mm bore conduit is to be 40 mm x 40 mm plaster cover at top shall be at least 3/8".

3. **FIXING OF CONDUIT IN CHASE**

The conduit pipes shall be fixed by means of staples or by means of saddles not more than 60 cm. apart. If pvc pipes are used, fixing of standard bends or elbows shall be avoided as far as practicable and all covers should be done by bending conduit pipes with along radius which will permit easy drawing in of conductors. All threaded joints of metallic conduits shall be treated with some approved preservative to secure protection against rust.

4. **INSPECTION BOXES**

Suitable inspection boxes shall be provided when necessary to permit periodical inspection and to facilitate removal of wires. These shall be mounted flush with wall / ceiling. For longer runs of conduit involving more than hand bend, one inspection box / draw-in box shall be used after one bend.

5. **TYPE OF ACCESSORIES TO BE USED**

All outlets such as switches, socket outlets shall be flush mounting type with cast iron or M.S. boxes with a cover of approved insulating material. The switches and other outlets shall be mounted inside such boxes as would be approved. The metal box shall be efficiently earthed with conduits by means of earthing attachment with no. 16 SWG G.I. wires, running inside the conduit.

6. **CONDUITS**

Steel – Specifications are given else-where.

PVC / Polythene – Medium gauge pipes of I.C.I. / Pioneer Plastic works Pvt. Ltd. or similar reputed make having 3 mm wall thickness shall be used.

For Roof Slabs – These shall be prelaid during casting of floor / roof slab and shall be drawn through 19 mm bore conduit / pipe.

7. **FISH-WIRE**

18 SWG G.I. wire shall be used and it shall protrude from the conduit ends by 9 inches.

8. **CONDUIT LAYING IN FLOOR / ROOF SLABS BEFORE CASTING**

PVC / G.I. conduits shall be laid straight as far as practicable and properly placed including binding with the steel reinforcement rods with 22 SWG G.I. wire so that a proper positions of conditions are maintained.

While laying the conduits for concealed wiring in the ceiling or in the beams and columns and before casting, the contractor shall ensure that both ends of the conduits are plugged by means of dead-end socket or otherwise so that any foreign matter cannot enter the conduits and choke them.

All precaution must be taken while laying the conduits on the slabs, R.C.C. walls, columns, etc. and the contractor shall rectify at his own cost of any defects are found during process of drawing cables through the concealed pre-laid conduits.

Each PVC / Polythene conduits shall be provided with protruding length of not less than 9 inches on fee and of the conduit.

There shall be no intermediate joints in one straight run of polythene conduit.

All ceiling outlets shall be terminated in round C.I. / G.I. circular box to suit standard size ceiling rose and / or rectangular C.I. / M.S. junction box as the case may be.

Use of junction boxes shall be made wherever possible to avoid looping inside switch-boards.

It will be mandatory for the contractor to get the layout approved by the Engineer-in-charge / Architect when the conduits are laid and bound to steel reinforcement rods, before he can release the work for casting of floor / roof.

9. CONNECTOR BOXES, DRAW-IN-BOXES

These shall be constructed from 16 SWG M.S. steel and have M.S. cover minimum size for connector boxes is 6" x 4" and for Draw-in-boxes 4" x 4".

PAINTING

Outside of all switch boards, connector boxes & draw-in-boxes and other C.I. / M.S. accessories shall be painted with two coats of anti-rust paint in addition given elsewhere.

CABLE INSTALLATIONS

GENERAL

Trenches shall be 2' 6" deep (minimum) from ground level and trenching work shall include all pumping and bailing out water. These trenches shall be wide enough to accommodate all the cables that are being laid in the same trench with spacing in between as per specification given below.

When more than one multicore cable is to be laid in the same trench, a minimum horizontal interaxial sparing between cables will be 0.25 m.

After excavation of the trench of proper size, the bottom of the trench shall be dressed and leveled and filled with a 3 layer of fine sand. The cable shall then be laid with bricks on both sides of the cable continuously. After having the space within the bricks, filled and packed upto a level of 3" (75 mm) above top of cable with fine sand, the top layer of bricks shall be placed side by side in continuous series as protective cover. Total no. of bricks required being 16 per meter run. The remainder of the trench shall be filled with riddled soil, well remmed and watered to a level of 3" (75 mm) above surrounding ground level. The ground level surface of the whole trench routs shall be restored properly after completion of cable laying.

(b) **INSIDE BUILDING**

Cables shall be laid on walls / ceiling / structure, unless specified otherwise, with M.S. brackets and suitable clamps. Cleats fixed on M.S. brackets, spaced not more than 1' 6" apart. Bolts of suitable size are to be grouted on the wall properly for fixing the brackets.

- (c) Minimum banding radius permissible is 12.D for PVC Armour cables. At joints and terminations, the individual core of multi core cables should never be bent so that the radius is less than 12 times the diameter over the insulation.

3. **CABLE JOINTING**

All cable joints shall be carried out by experience and licensed jointers under strict supervision. Electroplated brass cable gland, copper cable sockets and approved jointing materials must be used. The price for cable jointing and finishing the ends of the cable shall include all materials and shall also provide for tools and plants for the work. The cable armoring is to be properly terminated. All cable accessories and other associated materials shall conform to Indian Standard Specification where applicable.

4. **TESTING OF CABLES**

Immediately after the initial laying and jointing work is completed, a pressure test shall be applied to all cables. Cables of 1.1 KV grade suitable for use on medium voltage should withstand for one minute a test with a 1000 volt constant pressure "Megger" Insulation Tester. If the test is unsatisfactory, the cost of all repairs and replacements and all extra work of removal and relaying will be made good by the contractor.

5. **TESTING OF INSTALLATION**

Before the complete installation is put into service or handed over to Employer the installation is to be tested with a 1000 volt Insulation Tester to the satisfaction of the Engineer-in-charge. The completed work will be taken over only if the results are acceptable to the Architects / Employer.

EARTHING INSTALLATION

The installation shall generally conform to IS 3043-1966 (Indian Standard Code of Practice for Earthing, as amended upto date)

1. **EARTHING ELECTRODE**

The earthing electrode shall be galvanized steel pipe of class D medium quality - 50 mm (2") dia bore and 3.04 M (10') long. A hole shall be provided at 100 mm (4") from the top and to receive a 15 mm (1/2") dia galvanized bolt and nuts and the bottom and shall be chisel cut for easy penetration into soil.

A suitable trench shall be excavated about 0.45 M (1' 6") deep and the pipe electrode driven to an average depth of 11' below ground level. The top end of the electrode shall be at average depth of 0.30 M (1') below ground surface.

One no. 6 SWG G.I. wire (2 nos. 4 SWG in case of L.C. installation) shall be connected securely on the properly cleaned surface at the top end of pipe electrode by means of a 100 mm. (4") long x 13 mm (1/2") dia. G.I. bolt nut and double washers. The earth lead conductor shall be protected mechanically by means of a continuous length of G.I. Pipe (Class A) having 13 mm (1/2") inside diameter upto a height of 0.60 M (2') above ground and the same shall be completely filled with bitumen compound and topped upto overflowing.

2. **MASONRY INSPECTION PIT**

The inspection pit for the earth station shall be 0.60 M x 0.60 (2' x 2') and approx. 0.45 M (1' 6") deep when completed, having 5" thick cement brick work with 1st class bricks in cement mortar (6:1) both inside and outside plastered 19 mm (3/4") thick and neatly cemented 1.60 mm (1/16") thick, both inside and top outside. The opening on top shall be provided with a 0.46 M (1' 6") dia. C.I. manhole with C.I. cover fixed flush with ground surface duly back filled, dressed and rammed.

3. **LOCATIONS FOR EARTH ELECTRODES**

Electrodes shall be buried at least 2 m (6' 6") away from the building pole of object to be earthed. However, earthing electrodes for I.C. installations should be as close to the down conductors as possible.

Electrodes, when installed in parallel, shall not be placed less than 2 M (6' 6") apart and preferably placed at distances greater than twice their lengths.

Electrodes shall not be located in Entrances, Pavement and Roadways.

4. **EARTH BUS BAR**

(a) The bus bar shall be suitable size and length, as specified in the schedule of items, heavily galvanized and having adequate number of drilled and gapped holes 30 mm apart complete with G.I. bolts, nuts, washers for securely connecting the earth leads and earth continuity conductors. The bus bar shall be fixed on wall, having clearance of 6 mm from wall with spacing insulators with at least two numbers 13 mm (1/2") G.I. rag bolt spaced about 0.46 M (1' 6") apart.

(b) **COPPER FLATS**

To be used, as specified, in the schedule of items, where earthing requirements are more than stringent, brass bolts, nuts washers shall be used for connections.

(c) **VALUE OF EARTH RESISTANCE**

In case of installations where the load does not exceed 5 K.W. the resistance to earth shall on no account exceed 4 ohms. Where the load exceeds 5 K.W., the resistance will not exceed 1 ohm.

For sub-stations, the value is 1 ohm

For L.T. installations, the value is 11 ohm.

STREET LIGHTING

1. TUBELAR STEEL POLE

The pole shall be as specified in the schedule of items. It shall be complete with sole plates and cap, if required and shall have drilled holes of proper size at requisite place for earthing.

The pole shall be treated internally, as well as externally upto a height of 2.5 meters from butt and with special bituminous preservative solution, the remainder of the outside being painted with one coat of Red Oxide Primer.

2. ERECTION OF STEEL POLE

The hole made in the ground for single pole is to be approximately 1.85 mtrs. deep. A precast base block (600 x 150 mm thick) is to be properly placed at the bottom of the duly rammed hole and the pole painted with a fresh coat of black anti-corrosive paint but and upto a height 2.5mtrs and complete with sole plate and cap is to be erected, plumbed and lined up properly. The cable looping box of dimension as specified elsewhere, and polythene pipe / pipes also of specified dimension, for cables entry into the cable looping box from underground are to be fixed in specified position at this stage.

The C.C. foundation (1:3:6) of dimension 600 x 600 x 1680 deep shall then be cast using timber shuttering. The concrete mixtures after pouring into position shall be well spread and compacted by ramming. The shuttering shall not be removed within 48 hours after casting. Coverts work shall be properly cured after removal of shuttering and the excavated area around the foundation shall be back filled with earth duly rammed using water and consolidated in layer not exceeding 150 mm at a time upto the required level of ground surface.

Cement concrete muffing (1:3:6) of specified dimension shall be cast at the base of the pole upto the specified height above ground level and it shall accommodate the cable looping box. The muffing shall be finished with neat cement plastering of 3 mm thickness after the concrete work has properly set.

The pole shall be plumbed before and after the concrete work.

3. PAINTING

The pole shall be painted, after installation with one coat of primer and two coats of ready mixed anti-corrosive aluminum paint after preparation of surface by sand papering, cleaning etc. for receiving fresh coat of paint, including numbering of poles.

MATERIALS FOR C.C. WORK FOUNDATION ETC.

JHAMA CHIP

Jhama chip shall be obtained by breaking good quality jhama bats and shall not be son / or wit any coating of foreign material. These shall be of sizes $\frac{3}{4}$ " for base block and 1.1/4" / 1.1/2" (3/4 cm) for foundation works. These shall be screened for removal of dust.

SAND

Sand shall be coarse, sharp and free from clay, loam, any other foreign materials and shall be obtained from approved source.

CEMENT

No cement except from approved source shall be used. Cement damaged by water of otherwise shall not be used.

PAINT

Paint shall be of approved brand and quality and should be brought to site in original sealed container. Undergo circumstances shall the paint be diluted with linseed oil or otherwise.

L.C. INSTALLATION

SPECIFICATIONS

The installation shall confirm to I.S:2309-1969 as amended upto date.

1. CONDUCTOR FOR L.C. SYSTEM

It shall be well galvanized no. 4 SWG G.I. wire (Galvanizing confirming to B.S. 728/1961) unless specified otherwise. The conductor shall be well annealed and flexible.

2. AIR TERMINALS

Five pronged air terminal, constructed of four pieces of No. 4 SWG G.I. wire each 10" long. Bound and soldered to the down conductor 9" from the top and bend slightly outward, and stiffened with a 5' (1.5 M) long 15 mm class B, medium quality galvanized steel tube having a screwed galvanized M.S. flange 3" dia at bottom end for grouting in, shall be used, unless otherwise specified. Minimum number of Air Terminals is two.

3. CONDUCTORS ON PARAPET

The conductors shall be coursed along ridged, parapets, edges of the flat roof, over flat roof where necessary in such a way as to joint each air terminal to the rest. The conductors shall be fixed securely with galvanized iron staples 40 mm. (1/2") long and spaced not more than 4' (1.3 M) apart.

4. VERTICAL DOWN CONDUCTORS

The conductors, direct form earth termination, shall be connected to parapet conductors or air terminals and shall be coursed through shortest possible routes without abrupt turns or

kinks. While passing through cornices, these shall pass through G.I. pipe (Class B) having adequate bore. These conductors shall be fixed securely with galvanized iron staples 40 mm (1.1/2") long and spaced not more than 3' (1.0M) apart.

5. PROTECTION AGAINST DAMAGE AND CORRISION

No upturns are permitted and any bend necessary shall have a permissible radius. The end of G.I. protections on wall shall be properly scaled with bitumen compound to prevent corrosion.

6. METALLIC OBJECTS NEAR CONDUCTORS

The conductors shall be so laid as to maintain a separation distance exceeding 2 mtrs. (6' 6") between a) any electric conductor running in parallel, (b) metallic objects, viz; iron girders, water tanks, iron stair case, water / gas pipes inside or by the side of the building.

All the external metallic objects viz water tanks, gutters, rain water down pipes, water mains etc., shall be bonded to the nearest conductor by means of a short tail.

7. JOINTS & BONDS

All joints between conductors shall be made after clearance and tinning the ends of conductors to be joined, binding them together for about 100 mm (4") with no. 14 SWG G.I. wire and then soldering.

Bonding shall be as short as possible. All joints & bends are to be mechanically and electrically.

8. EARTH STATIONS

Similar to installation earths as specified elsewhere minimum number of earth station is two.

9. INSTALLATION TESTS

After completion of works the ohmic resistance of L.C. installation complete with air terminals (without earth connection) shall be measured from the highest point and this shall be a fraction of one ohm. The resistance to earth of individual earth stations shall be tested by earth testing megger and must not exceed 10 ohms.

The above tests shall be made in the presence of the representative of the Engineer-in-charge / Architects / Consultants and the results recorded.

10. COMPLETION DRAWING

This shall be submitted within one month from the date of completion.

LIST OF MATERIALS WITH SUGGESTIVE BRAND AND THEIR MANUFACTURE

CEMENT (PPC)	:	KONARK / ULTRA-TECH / LAFARGE / ACC
STEEL	:	TMT Bars of SAIL / TATA / RIN / ISI APPROVED
WHITE GLAZED TILES	:	H & R JOHNSON / CERA / KAJARIA / NITCO
FLUSH DOORS AND PLYWOOD PRODUCTS INCLUDING TEAK PARTICLE BOARDS.	:	MAYUR / CENTURY / GREEN
STEEL DOORS, WINDOWS & VENTILATORS.	:	LOCALLY MANUFACTURED.
ROLLING SHUTTERS & GRILLS	:	LOCALLY MANUFACTURED.
ALUMINIUM DOORS, WINDOWS, SECTIONS, PARTITIONS.	:	MADE FROM JINDAL/OEL/INDAL
WATER PROOFING COMPOUNDS	:	PIDILITE/SIKA/ROFF/FOSROC
PAINTS AND DISTEMPERS.	:	SHALIMAR/ASIAN/BERGER/ JOHNSON & NICLOSON/ICI
REDOXIDE FOR IPS FLOORING	:	SHALIMAR/ICI
REXODIDE ZN CHROMATE	:	SHALIMAR/ASIAN/BERGER
WATER PROOF CEMENT PAINTS	:	ASIAN PAINT / BERGER
GLAZING SHEET GLASS	:	MODIGUARD-FLOAT GLASS/ TRIVENI/AIS
HARDWARE FITTINGS		
(i).FERROUS	:	AS Approved
(ii).NON- FERROUS	:	AS Approved.
CERAMIC TILES	:	NAVEEN/REGENCY
VITIFIED TILES	:	NAVEEN/BELL/OREVA

SANITARY AND PLUMBING WORK

1.	Sanitary Fittings	Hindware / E.I.D. Parry (India) Ltd. / CERA
2.	Pressed Steel Flushing Cystem	E.I.D.Parry/Hindware / CERA
3.	Choromioum Plalted Brass Fittings	Essco/Jaguar/Mark / CERA
4.	PVC soil waste Pipe & Fittings	Finolex/Oriplast
5.	CPVC Pipes & fittings	Ajay floor guard/Finolex
6.	G.I. Fittings	ISI APPROVED
7.	Gummetal Valve	ISI APPROVED
8.	Glazed stone ware pipe & fittings	LOCALLY AVAILABLE BEST QUALITY
9.	PVC pipes & fittings	M/s Oriplast/Finolex / SUPREME
10.	Cast Iron Manhole Clover & Frame Locally available best Quality	ISI Approved.
11.	Plastic Seat for E.P.W.C.	Commandar,Bestolite, Esco
12.	Mirror	As Approved

LIST OF MATERIALS OF APPROVED BRAND AND/OR MANUFACTURER

Sl.No.	Description	Name of the Manufacturer
1	Aluminium extrusion for doors, partitions, etc.	ALOM/HINDALCO or any other approved manufacturer conforming to I.S. specifications.
2.	Hardware	
a)	Aluminium	M/s Metako, M/s Allen, M/s Crown with ISI mark or similar approved by Company.
b)	Brass	M/s Brass Arts (India)Pvt.Ltd. M/s Vijay Industrial Engineering Corporation or similar approved by Company.
c)	Locks (Door)	M/s Godrej, M/s Acme Locks Ltd. M/s Secure Industries Ltd. M/s Yale India Ltd.
d)	Lock (Furniture)	M/s Efficient Gadjets M/s Godrej or similar approved by Company.
e)	Floor Spring	M/s Everite Agencies Pvt. Ltd. M/s NITA Floor Spring
f)	Screw	M/s Nettle Fold/G.K.W.
g)	Castors	M/s Efficient Gadjets
h)	Sliding drawer channels	M/s Efficient Gadjets M/s Earl Behari
3.	Synthetic enamel paint, Distemper, plastic emulsion Paints	M/s ICI Ltd. M/s Berger Paints(I) Ltd. M/s Jenson & Nicholson(I) Ltd
4.	Glazing	M/s Modi Float Glass Ltd. M/s Float Glass India Ltd. M/s Continental Float Glass Lt M/s Gujarat Guardian Ltd.

Note:- If the approved brands mentioned above are not available, equivalent make as may be approved by the Architect/Consultant/ Company only to be used.

SUGGESTIVE LIST OF MATERIALS AND THEIR MANUFACTURERS
ELECTRICAL

<u>ITEM</u>	<u>MAKE/BRANDS</u>
1. Switch fuse with H.R.C. fuse	ALSTOM / CROMPTON / L&T / SIEMENS
2. Switch fuse with rewirable type fuses	ALSTOM / ENGLISH ELECTRIC / CROMPTON / L&T / SIEMENS
3. Isolator	ALSTOM / ENGLISH ELECTRIC / CROMPTON / L&T / SIEMENS
4. Splitter Switch	-do-
5. Iron clad change-over switch	-do-
6. 1.10 K. V. grade PVC insulated armored aluminium cables, STI PVC	CCI / GLOSTER / FINOLEX
7. 440 V/1.10 K.V. grade PVC insulated & unsheathed / copper wire, PVC insulated and flexible cords FR & HR PVC	FINOLEX / ANCHOR / HAVELS
8. Steel conduit pipes and Accessories Black enameled	1st class as per IS.9537 Part-II, 1981 (Pipe samples to be approved) 1st class G.I. Pipe.
	Galvanized
	-do-
9. PVC / Polythene pipes	1st class pipe (ISI Mark) (Heavy Type)
10. G.I. Pipe	-do-
11. 30A/60A DP molded Isolating switch	ANCHOR / G.E.C. /L & T
12. Miniature Circuit Breaker / M.C.B. Type Isolator with factory made D.B. Board	MDS / L&T / SIEMENS / LEGRAND
13. Voltmeter / Ammeter / Selection switch Bakelite cover	L & T / AE

14.	15 Amp. / 5 Amp. piano key type switch & Flushed type plug socket	ANCHOR / CONA
15.	Ceiling Rose / Angle Holders	ANCHOR / CONA
16.	Telephone Wire Holder	FINOLEX / DELTON / ANCHOR/ INCAB / NETCO
17.	Luminous indicating type buzzer with cancellation push	ANCHOR / HAVELS
18.	Buzzer	HAVELS – C RABTREE - ATHENA
19.	15 Amp. / 5 Amp. / plate type switches and sockets over PVC / G.I. metallic boxes	- do -
20.	Call bell / Alarm bell	ELLORA /ANCHOR
21.	Bulk head light fittings	G.E.C. / CROMPTON / BAJAJ / PHILIPS
22.	Flourescent & M.V. light	PHILIPS / G.E.C. / BAJAJ / CROMPTON
23.	Ceiling Fan	G.E.C. / CROMPTON / KHAITAN/ USHA / ANCHOR / ALMONARD
24.	Exhaust Fan	G.E.C. / CROMPTON / KHAITAN/ USHA / ANCHOR / ALMONARD
25.	Paint	Shalimar / Jenson & Nicholson / British paint / Tata
26.	Mirror Optics Lights	Phillips / ECG / Decon / Anchor / Oasis
27.	Compact Florescent Light	Phillips / Crompton Greeves
28.	150KVA, 11/0.4 KV	OEU / KT PVT. LYD / ALPHA DYN-11, ONAN Type cooling
29.	Data wire & Accessories	D-Link / SYSMAX
30.	Automatic A. C. starter	GEC / L& T

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 approximately 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 leads unless otherwise mentioned specifically in the description of 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 labour 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 onjuy, 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 labour, 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 labour and materials shall be entertained.

11. The Electrical Installation work shall be carried out under the supervision of registered Electrical Contractor and licensed Electrical Supervisor duly authorized the “Electrical Licensing Board, Govt. of Orissa” to carry out Electrical Installation work to domestic and industrial installation upto 650 volts. All as per clause 21 of Special Conditions of Contract.

PRICE BID

PART-2

Bidders to submit the Price- Bid online in the E- Tendering Portal only