



CHIEF ENGINEER'S OFFICE
NORTHERN ZONAL OFFICE, NEW DELHI

PART – II

**TENDER FOR BUILDERS WORK, WATER SUPPLY,
SANITARY INSTALLATION, ELECTRICAL INSTALLATION
AND OTHER ANCILLARY WORKS**

FOR

**CONSTRUCTION OF
OFFICERS' QUARTERS BUILDING**

AT

JAITARAN (RAJ.)

Issued to

M/S _____

Date of Pre-Bid Meeting : 08.02.2015 at 11.00 Hrs.

Last Date of Submission of tender : 16.02.2016 up to 15.00 hrs.

Date of opening of Pre-Qualification Bid: 16.02.2016 at 15.30 hrs.

Note: Contractors should sign all the pages of Tender Documents.

**LIFE INSURANCE CORPORATION OF INDIA
NORTHERN ZONAL OFFICE,
NEW DELHI**

**TENDER FOR BUILDER'S WORK, WATER SUPPLY, SANITARY
INSTALLATION, ELECTRICAL INSTALLATION AND OTHER
ANCILLARY WORKS FOR CONSTRUCTION OF
OFFICERS' QUARTERS BUILDING AT JAITARAN (RAJ.)**

PART – II

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 LIC भारतीय जीवन बीमा निगम LIFE INSURANCE CORPORATION OF INDIA	Life Insurance Corporation Of India Northern Zonal Office, Engineering Deptt, 2 nd Floor, 25, K.G.Marg, NEW DELHI-110 001 Tel: 011-28844180, 28844182, e-mail: nz_engg@licindia.com				
<u>DIRECT TENDER NOTICE</u>					
Life Insurance Corporation of India intends to invite Percentage Rate Tender under THREE BID Tendering System for Construction of OFFICERS' QUARTERS BUILDING at JAITARAN (RAJ.) which includes Main Building work including Civil, Plumbing, Sanitary, Electrical work, & Ancillary works etc. The proposed construction shall be of R.C.C. framed structure with modern Architectural finishes of high order having Ground plus One floor with a Total Built-Up Area of 6450 Sqft (Approx).					
The Eligibility Criteria are as detailed below:-					
Estimated Cost (Rs. In Lac)	Completion period in months	Minimum Bank Solvency* (Rs. In Lac)	Average Annual Turnover during last 4 years (Rs. In Lac) 2011-12, 2012-13, 2013-14 & 2014-15	Qualifying Value of Similar Nature** of Single work completed during last 7 years prior to date of publication of this Notice (Rs. In Lac)	Bidding Capacity# (Rs. In Lac)
A	B	C	D	E	F
92.31	09	18.46	46.16	1. <u>Three similar</u> completed works costing not less than the amount equal to Rs. 36.93 Lac OR <u>Two similar</u> completed works costing not less than the amount equal to Rs.55.39 Lac OR <u>One similar</u> completed work costing not less than the amount equal to Rs.73.85 Lac AND 2. <u>One completed work of any nature</u> (either part of above or a separate one) costing not less than the amount equal to Rs. 36.93 Lac with some Central Govt. Deptt./ State Govt. Deptt./ Central Autonomous Body/ State Autonomous Body/ Central Public Sector Undertaking/ State Public Sector Undertaking/ City Development Authority/ Municipal Corporation of City Formed under any act by Central/ State Govt. and published in Central/ State Gazette.	Equal to or more than 92.31

Selection Criterion for working Contractors in L I C of India (LIC): Working contractors of LIC of India means the Contractors who have executed similar nature of work** in LIC or else where during the last seven years prior to date of publication of this Tender Notice and fulfilling all the eligibility criteria.

A	B	C	D	E	F
92.31	09	15.69	39.23	1. <u>Three similar</u> completed works costing not less than the amount equal to Rs. 31.39 Lac OR <u>Two similar</u> completed works costing not less than the amount equal to Rs.47.08 Lac OR <u>One similar</u> completed work costing not less than the amount equal to Rs.62.77 Lac AND 2. <u>One completed work of any nature</u> (either part of above or a separate one) costing not less than the amount equal to Rs.31.39 Lac with some Central Govt. Deptt./ State Govt. Deptt./ Central Autonomous Body/ State Autonomous Body/ Central Public Sector Undertaking/ State Public Sector Undertaking/ City Development Authority/ Municipal Corporation of City Formed under any act by Central/ State Govt. and published in Central/ State Gazette.	Equal to or more than 92.31

* **Solvency certificate** should not be more than 3 months old prior to date of publication of this Notice.

** **Similar Nature of work:** i.e. Building work which may be Office, Residential Buildings, Shopping complex, Commercial Buildings but not Industrial Buildings like Ware house, factories, Plant etc.

The bidding capacity shall be worked out by the following formula:

Bidding Capacity = $[A \times N \times 2] - B$, Where,

A= Maximum value of similar nature of works executed in any one year during the last four years prior to the date of publication of this Tender Notice, taking into account the completed as well as the works in progress.

N = 9/12 (years)

B=Value of existing commitments and on going works to be completed within 09 months from last date of submission of Tender for this work.(An affidavit duly notarized in support of this statement is must)

Only those contractors who have executed similar nature of work of required amount (Similar nature of work means Building work which may be Office, Residential Buildings, Shopping complex, Commercial Buildings but not Industrial Buildings like Ware house, factories, Plant etc.), and fulfilling the above criteria are eligible to submit the duly filled-in Enrolment Form and Tender, which will be available on our website and are to be downloaded from **24.01.2016 to 15.02.2016**.

The **Pre-Qualifying Bid** containing duly filled-in **Enrolment Form** along with the Annexure A1, A2 and B to G and the **Integrity Pact**, **EMD Bid** containing the EMD in the form of DD/ Pay Order and **Financial Bid** containing duly filled-in **Part-II** of the Tender with the Pre-priced schedule of Quantity, are required to be submitted to **The Chief Engineer**, Engineering Deptt, Northern Zonal Office, 'Jeevan Prakash', 2nd Floor, 25, K.G. Marg, NEW DELHI-110001 on or before **16.02.2016 till 15.00 hrs.**, along with **non-refundable Tender Cost of Rs.5000.00 (Rupees Five Thousand only), {Rs.2000.00 as Enrolment form fee and Rs.3000.00 as Tender document fee}**, payable in form of Demand Draft/ Pay Order in favour of "**Life Insurance Corporation of India**" payable at New Delhi.

The **Pre-Qualifying Bid**, **EMD Bid** and **Financial Bid** shall be completely filled in all respects, along with these instructions for filling and submission of the **Tender**.

1. **Envelope-1** : The **Tender Cost, Enrolment Form Fee and EMD** of prescribed amount (Refer instructions of Tender (Part-II), in the form of Demand Draft/ Pay Order/ Bank Guarantee shall be put in a separate sealed envelope, duly super scribed as **Envelope-1**.
2. **Envelope-2 : Pre-Qualifying Bid** containing duly filled-in Enrolment Form with credentials of the applicant to be submitted in the specified format along with all supporting documents like Solvency Certificate from Banker, Work Completion Certificate for works executed during last 7 years, Certificates for works in progress, availability of Tools, plants, machineries and manpower, Constitution of the Organization, Bank Statement for last 12 months, Service Tax Registration Certificate, Statement of Accounts for last 4 consecutive years duly certified by Chartered Accountant with Registration number etc. These documents are to be self attested by the authorized person of the applicant with an undertaking that full responsibility is taken by him/ her on behalf of the applicant for submitted documents' veracity. **The Bidders have also to submit an integrity pact along with the Pre-Qualifying Bid.** All these documents shall be submitted in a sealed envelope duly super scribed as **Envelope-2**.
3. **Envelope-3** : The **Financial Bid** containing the **Part-II** of the Tender including the filled-in **Pre-Priced Schedule of Quantities**, shall be submitted in a separate sealed envelope duly super scribed as **Envelope-3**.

All these Three envelopes shall be sealed in a Bigger Envelope duly super scribed with the Name of the work, Name of Applicant with full postal address with Telephone number and email id., and, the last date for submission of the tender.

Please note that the Part-I of the Tender is not required to be submitted initially while submitting the Tender. However, It will be a part of Contract Agreement with the successful Bidder.

The PRE-BID MEETING will be held in the Chief Engineers Office at the above address on 08.02.2016 at 11.00 hrs.

Technical bid comprising of Envelope 1(EMD) Envelope 2(Enrolment form and supporting documents) will be opened at 15:30 hrs on 16.02.16

Note: The contractors will be selected only after satisfactory verification of the genuineness of the Bank Solvency and Credentials of the submitted documents by collecting Confidential report of executed works from their clients &/or Site inspection report of executed work/ work in progress etc. The credentials of works executed under Joint-Ventures system and applications from Joint Venture agencies shall not be accepted.

The Chief Engineer reserves the right to reject the Tender submitted by any or all contractor/s at his sole discretion without assigning any reason whatsoever.

Date: 24.01.2016

Chief Engineer

LIFE INSURANCE CORPORATION OF INDIA
INSTRUCTIONS IN REGARD TO SUBMISSION OF TENDERS

NOTE : Tenderer should note that non-compliance of the following instructions will render the tender liable for rejection.

1. **Address to which the tender marked “Original”(PINK COVER Page) is to be submitted :**

The Chief Engineer, L.I.C. of India, Northern Zonal Office, Jeevan Prakesh, 2ndFloor, 25 K.G. Marg , New Delhi – 1100 001.
 2. (a) **Last date for receipt of tenders: 16.02.2016 upto 15:00 hours**

(b) **Date of Pre-Bid Meeting : 08.02.2016 at 11.00 hours in the Office of the Chief Engineer at the address mentioned above.**
 3. Tenderer should ensure that the tender is received before the date and time specified above.
 4. Tenderer should fill in all the relevant blanks and put his signature on the relevant places as indicated below :
 - a. Letter from Contractor to Chief Engineer
 - b. Appendix to the “Conditions of Contract”
 - c. Appendix to the “General Instructions to the Contractors”
 - d. Last page of the General Preambles to Schedule of Quantities
 - e. Every page of schedule of quantities and general summary.
 5. The schedule of Quantities should be filled as follows :
 - a. The “Rate” column to be legibly filled in ink in both FIGURES AND WORDS.
 - b. “Amount” column to be filled for each item and the total amount for each trade to be given.
 - c. All corrections to be initialled.
 - d. Each page of the Schedule of Quantities and the “General Summary” is to be signed by the Contractor.
 - e. Tenderer should note that he is to quote **Percentage Below/ At Par/ Percentage Above**, over our pre-priced schedule of rates.
- Note:** The subject tender being invited on **PERCENTAGE** rate basis the clause Nos. 5 (a) & (b) are not applicable for this tender.
6. No alterations or additions are to be made by the tenderer to the text or the Schedule of these tender papers. Any tender which proposes any alterations to any of the condition/s laid down or which proposes any other conditions of any description whatsoever is liable to be rejected.
 7. The tenderer is required to check the numbers of the pages and should any be found missing or in duplicate, or the figure or writing indistinct, he must inform the

Chief Engineer / Issuing Officer at once and have the same rectified. Should the tenderer be in doubt about the precise meaning of any item or figure, for any reason whatsoever, he must inform Chief Engineer in order that the correct meaning may be decided upon before the date for the submission of the tender.

8. No liability whatsoever will be admitted nor claim allowed in respect of errors in the submitted tender due to missing / duplicate pages, indistinct writing or any other error in the tender documents which should have been rectified in the manner described above.
9. Proforma of Articles of Agreement (Annexure – ‘A’) should not be filled in by the tenderer. While the contract shall be deemed to have come into existence on issue of letter of acceptance to the successful tenderer, formal agreement shall be signed thereafter with the successful tenderer on non-judicial stamp paper of requisite value as per the proforma of Articles of Agreement.
10. Earnest Money accompanying the tender will be accepted in the form of “**CROSSED DEMAND DRAFT**” of any of the Nationalised Banks or Scheduled Banks drawn in favour of the “**LIFE INSURANCE CORPORATION OF INDIA**” payable at NEW DELHI only, and not in favour of any other Authority or location. In addition to this, Earnest Money can also be accepted in the form of Bank Guarantee. In such cases, 50% of EMD or Rs.20 lacs whichever is less, is to be deposited in the form of Cash (upto Rs. 49,999/- only) / Demand Draft (DD) / Pay Order (PO) / Banker's Cheque (BC) and balance amount will be in the form of Bank Guarantee (BG) issued by a Nationalised or Scheduled Banks. The Bank Guarantee (BG) shall be accepted at the time of opening of tender after due verification from the issuing bank authorities. The Earnest Money given by all the tenderers except the lowest tenderer will be refunded within seven working days from the date of opening of tenders.
11. The tender shall be accompanied by a certified true copy of Power of Attorney in favour of the signatory to the tender documents. If the tender is submitted on behalf of a firm, it must be signed either by all partners or person holding a valid power of attorney from all partners constituting the firm. The person signing the tender on behalf of another partner(s) or on behalf of a firm on Company shall attach with the Tender a proper Power of Attorney duly executed in his favour by such other person(s) or by all the partners in accordance with the Constitution of the Company / Articles of Association, stating that he has the authority to sign on behalf of such other person(s) of the firm or the Company as the case may be, in all matters pertaining to the contract including the Arbitration Clause.
12. Contractors are warned that Cash, or Insurance Guarantee, or Fixed Deposit receipt in lieu of the aforementioned form of Earnest Money remittance will not be accepted.
13. **The Part-II of the tender along with the Enrolment Form and EMD should be submitted as detailed in the Direct Tender Notice/ Enrolment Form.** Please note that the Part-I of the Tender is not required to be submitted initially while submitting the Tender. However, It will be a part of Contract Agreement with the successful Bidder.

14. The rates mentioned in the Part –II of the tender copy will be taken as bonafide. When the rates in figures and words are at variance, the rate corresponding to the amount shall be taken as correct. In all other cases rate in words will be taken in precedence over the rate in figures.
15. Tenders containing errors are liable to be considered non-bonafide at the discretion of the Chief Engineer
16. Tenderer should note that tender should remain open for consideration for a minimum period of **THREE MONTHS** from the date fixed for the receipt of tenders.
17. The Life Insurance Corporation of India reserves the right to accept any tender or to accept tenders in part; to reject any or all tenders without assigning reasons thereof.
18. Contractors should fill in “**Quoted percentage/Total Quoted Tender amount**” column in the **SUMMARY** legibly in ink in both **FIGURES** and **WORDS**. **Total Quoted Tender amount** mentioned in words shall be prefixed and suffixed by “**Rs.**” And “**only**” respectively. Tenders containing the **Quoted percentage/Total Quoted Tender amount** only in figures are liable to be considered non-bonafide at the discretion of the Chief Engineer and entail forfeiture of Earnest Money Deposit.
19. If on check there are differences between the **Quoted percentage** given by the contractor in words and figures, or in the Quoted Tender amount worked out or no Tender amount quoted by him the following shall be considered:
 - a) When there is a difference between the Quoted percentage in figures and in words, the Quoted percentage which correspond to the Total Quoted Tender amount worked out by the contractor, shall be taken as correct.
 - b) When the Quoted percentage by the contractor in figures and in words tallied but the amount is not worked out correctly, the Quoted percentage by the contractor shall be taken as correct and not the amount.

LIFE INSURANCE CORPORATION OF INDIA

LETTER TO CONTRACTOR FROM CHIEF ENGINEER

To,

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Dear Sir / Sirs,

SUB: TENDER FOR BUILDER'S WORK, WATER SUPPLY, SANITARY INSTALLATION, ELECTRICAL INSTALLATION AND OTHER ANCILLARY WORKS FOR CONSTRUCTION OF OFFICERS' QUARTERS BUILDING AT JAITARAN (RAJ.)

We forward herewith PART-I of TENDER (consisting of standard tender conditions, specifications etc.) and PART-II of TENDER (Schedule of Quantities etc.) for above referred work. Please note that one copy PART-II of the tender duly filled in should be submitted to **The Chief Engineer, L.I.C. of India, Northern Zonal Office, Jeevan Prakesh, 2nd Floor, 25 K.G. Marg, New Delhi – 1100 001**, in the sealed envelope as detailed in the Direct Tender Notice, so as to **reach on or before 15:00 hours on 16.02.2016. Please note that the Part-I of the Tender is not required to be submitted initially while submitting the Tender. However, It will be a part of Contract Agreement with the successful Bidder. The Date of Pre-Bid Meeting is 08.02.2016 at 11.00 hours in the Office of the Chief Engineer at the address mentioned above.**

- 1) The tender drawings for the work are attached with Part-II.
- 3) Sealed tenders in the self addressed envelope and accompanied by **Earnest Money Deposit of Rs. 1,38,500.00 (Rupees)** along with filled-in Enrolment Form will be received at the office of Chief Engineer at above address **on or before 15:00 hours on 16.02.2016** and the **Pre-Qualification Bids** will be opened on **16.02.2016 at 15.30 hours** in the presence of contractors or accredited representatives, who attend. Tenderer should ensure that their tender is received before the date and time specified as no consideration whatsoever shall be given for postal or any kind of delays. Tenders received late shall be rejected.
- 4) If tender is delivered by hand, tenderer must ensure that the date and time of receipt is endorsed on the tender envelope by the A.O. or any other Officer of the Department approved by the SE / EE (Planning) and thereafter the tender is deposited in the tender box by the tenderer or his representative.
- 5) The Life Insurance Corporation of India does not bind itself to accept the lowest or any tender.

Yours faithfully,

CHIEF ENGINEER

LIFE INSURANCE CORPORATION OF INDIA**LETTER FROM CONTRACTOR TO CHIEF ENGINEER**TO BE SUBMITTED ON OR BEFORE **15.00 hours on 16.02.2016**

Date:

To,
The Chief Engineer
LIC of India,
Engineering Department,
2nd Floor,
Jeevan Prakash,
25 K.G.Marg,
New Delhi-1100001

NAME OF WORK: TENDER FOR BUILDER'S WORK, WATER SUPPLY, SANITARY INSTALLATION, ELECTRICAL INSTALLATION AND OTHER ANCILLARY WORKS FOR CONSTRUCTION OF OFFICERS' QUARTERS BUILDING AT JAITARAN (RAJ.).

Dear Sir,

1. Having examined and understood the Specifications of the materials for its supply at the site of work as well as for labour for all types of work including specialized work, Conditions of Contract and General Instructions relating to Part-I of tender and Schedule of Quantities relating to the above work of PART II of the tender and the drawings and other related terms and conditions, amendments etc. and having visited and examined the site of the proposed works and having acquired the requisite information relating thereto as affecting the tender invited by you on behalf of the Life Insurance Corporation of India, I/We, the undersigned hereby offer to construct, execute, complete and maintain the proposed works on **PERCENTAGE RATE** basis in strict accordance with the Contract Conditions and Specifications for the sum of Rs. _____ /-(Rupees _____ only) or such other sums as may be ascertained in accordance with the said Conditions.
2. I/We, undertake to complete and deliver the whole of the works within a period as specified in Appendix to the Conditions of Contract from the date of issue of intimation from you that the tender has been accepted and upon receiving possession of the site. I/We, shall be under the obligation to pay the sum as stated in the Appendix to the Conditions of Contract for every day that the works shall remain incomplete, damages as compensation subject to the Conditions of Contract relating to extension of time.
3. I/We, enclose herewith my/our tender along with **Earnest Money Remittance of Rs..... (Rupees only)** in the form of **CROSSED DEMAND DRAFT PAYABLE AT New Delhi** (put in a separate sealed envelope). I/We, hereby agree that this sum shall be forfeited by us to the 'Life Insurance Corporation of India' in the event of my/our tender being accepted and I/We, fail to execute the Contract when called upon to do so, as detailed in the Appendix to the Conditions of Contract.

4. *The Earnest Money Deposit of Rs. _____/-
(Rupees _____ only) is
enclosed in the form of Demand Draft drawn on _____ and
payable at New Delhi.

OR

- * The Earnest Money Deposit of Rs. _____/-
(Rupees _____ only) is enclosed
in the form of Demand Draft drawn on _____ and payable at New Delhi.

AND

Balance Earnest Money Deposit of Rs. _____/-
(Rupees _____ only)
is enclosed in the form of Bank Guarantee issued by _____ and payable at
New Delhi.

Note : An amount equal to 50% of EMD or Rs.20 Lac, whichever is less, needs to be deposited in the form of Cash (upto Rs.49,999/- only) / Demand Draft (DD) / Pay Order (PO) / Banker's Cheque (BC) issued by a Nationalized or Scheduled Bank and payable at New Delhi and balance EMD amount can be deposited in the form of Bank Guarantee (BG) issued by a Nationalized or Scheduled Bank as per specimen given in Annexure "E" to Conditions of Contract (put in a separate envelope supplied by LIC).

OR

*The EMD of Rs. _____ has been deposited in cash (upto Rs.49,999/- only) in the Accounts Dept. of _____ and M.R.No. _____ dt. _____ is enclosed (♠)

5. In the event of the tender being accepted:

* I/We, agree to the retention of my/our EMD as a part of Security Deposit and the balance amount of Security Deposit to be recovered at 7.5% of Gross Value of work done from my / our Running Account Bills.

OR

* I/We, agree to furnish a lump sum Security Deposit amounting to Rs. _____ (Rupees _____ only) in the form of Bank guarantee from any Nationalized Bank or Scheduled Bank located at _____ or _____ as per specimen given in Annexure "B" to Conditions of Contract, within 21 (Twenty One) days from the date of issuance of acceptance of tender or within 21 (Twenty One) days from the extended date as may be extended by the Chief Engineer.

6. I/We, note that the Earnest Money Deposit of Rs. _____/-
(Rupees _____ only) would be refunded to me/us.

- a. On expiry of the validity of the tender or earlier at the discretion of Chief Engineer in case my/our tender is not accepted and

- b. In case my/our tender is accepted, after I/We, furnish Bank Guarantees as mentioned above.

Yours faithfully,

(SIGNATURE OF THE CONTRACTOR)

Name and Seal

NAME OF THE PARTNER OF THE FIRM

OR

NAME OF THE PERSON HAVING POWER OF
ATTORNEY TO SIGN THE CONTRACT
(CERTIFIED TRUE COPY OF THE POWER
OF ATTORNEY SHOULD BE ATTACHED)

***Strike out whichever is not applicable**

(♠) EMD amounting to Rs.49,999/- or less may be deposited in cash in the Accounts Dept. of the Office where tenders are to be received.

APPENDIX TO CONDITIONS OF CONTRACT

TENDER FOR BUILDER'S WORK, WATER SUPPLY, SANITARY INSTALLATION, ELECTRICAL INSTALLATION AND OTHER ANCILLARY WORKS FOR CONSTRUCTION OF OFFICERS' QUARTERS BUILDING AT JAITARAN (RAJ.).

ESTIMATED COST : Rs. 92,31,350.50

PERIOD FOR COMPLETION : 09 Months

EARNEST MONEY DEPOSIT : Rs.1,38,500.00

Sl. No.	Clause Nos.	Description	Remarks
1 (a)	11	Minimum requirement of Technical staff ;	a) One Resident Engineer having a recognized Diploma in Civil Engineering with 2 years experience.
1 (b)	11	Recovery for Non Deployment of Engineer/s at the Site	a) Resident Engineer: Rs. 20,000 /- per month.
2	13	Date of commencement	1. Either 21(Twenty one) days from the date of acceptance letter issued to the contractor OR 2. The day on which contractor is instructed to take possession of the site, whichever is earlier
3	13 & 26	Date of completion	09 Months from the date of commencement
4	18.7	Reward for Early Completion	If the contractor completes the work 3 months in advance in all respects with respect to the final date of completion and the Chief Engineer certifies in writing that in his opinion the same has been completed, 0.5% of Final Contract Sum stipulated in the original contract shall be rewarded. If the contractor completes the works less than 3 months in advance in all respects with respect to the final date of completion and the Chief Engineer certifies in writing that in his opinion the same has been completed, 0.1% of Final Contract Sum stipulated in the original contract shall be rewarded.
5	19	Liquidated damages For contracts having time for completion (a) 6 months & less	Quantum of liquidated damages 1% of contract sum per week subject to a maximum of 10%.

		(b) exceeding 6 months	0.5% of contract sum per week subject to a maximum of 7.5%
6	21	Period of final measurement	60 (Sixty) days
7	22	Interim certificate	Monthly
8	22	Period of honouring interim certificate	20 (Twenty) days
9	22	Period of honouring final certificate	90 days from the date of submission of final measurements with details.
10	35	Security Deposit and Performance Guarantee :	a) Rs 4,61,600/- as Security Deposit only. b) Performance guarantee is required if tender amount is less than Rs 200 lakhs
11	35	Recovery of Security Deposit	In case of cash option, the EMD shall be retained as part of Security Deposit and balance Security Deposit shall be accumulated through deductions from Running Account Bills at 7.5% (maximum) of gross amount of bill. In case of Bank Guarantee option, the Contractor shall furnish one Bank Guarantee for full amount of Security deposit valid till end of defects liability period OR, Two Bank Guarantees of like amounts each equal to half the Security deposit; one valid till virtual completion and the other till end of defects liability period
11 a	35	Refund of EMD :	a) If the lowest tenderer withdraws his tender before the expiry of validity period or before the issue of Letter of Acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the department, then the department shall, without prejudice to any other right or remedy be at liberty to forfeit 25% of the Earnest Money absolutely and the balance Earnest Money will be refunded.
12	37	Interest on Lump sum Advance	10.00 % p.a. Simple Rate of Interest.
13	17.5	Contractor's All Risk Policy inclusive of Third Party Liability	a) For contract value upto Rs.2.00 crore – 7.5% of Tender Amount
14	17.6	Workman's Compensation Policy	As per mutual agreement.

15	17.9	Recovery for non Extension of Insurance Policies (Workman's Compensation and Contractor's All Risk Policy inclusive of Third Party Liability)	If not extended on time, LIC shall extend the Insurance policies on its own and apart from financial expenses, LIC shall deduct penalty amounting to Rs.10,000/- or double the premium amount whichever is more, for each extension of such policy.
16	27	Defect Liability Period	12 Months
17		Guarantee for Waterproofing and Anti-termite treatment	The guarantee for anti termite and waterproofing treatment starts from the date of Virtual Completion of the work till their relevant guarantee period expires.
18		Recovery of Water and / or Electricity Charges from Contractor's Bill.	0.50% of the Gross Value of work done if Water / Electricity from the Employers Source are used.
19	22.6	No Claim Certificate	To be given on Contractor's letter head

Note: **TAXES, DUTIES, LEVIES AND DEDUCTION AT SOURCE:**

- The contractor shall be responsible to pay all statutory levies imposed by the State and Central Government such as Income Tax, Sale Tax on works contract, Value Added Tax (VAT), Labour Cess, Excise Duty, Octroi and any other applicable taxes etc., and the rates quoted in the tender shall allow for the same.
- Liabilities towards Service Tax for Contractor and Employer shall be in accordance with relevant provisions of the Finance Act, 2012 or any amendment issued by concern Authority from time to time.
- Rates are inclusive all the taxes excluding Service Tax and contractors will be responsible for payment of applicable Service Tax (contractor's part) to concerned authority, which will be reimbursed to contractor on production of proof of, payment of Service Tax deposited.
- All the bidders are required to submit a copy of the Service Tax number provided by the Central Excise Department.
- Deduction at source of Income/Sales Tax on works contract, Labour Cess etc. shall be made by LIC of India as per the provisions prevailing from time to time from the Running Account or Final Bills and remitted to the concerned Taxation Authorities/ State Government on behalf of the contractor.
- This will supercede all provisions given in the tender elsewhere regarding Service tax.

NO CLAIM CERTIFICATE CUM RECEIPT

Received Rs. _____ (Rupees _____)
being the amount against my/our final bill dated _____ for _____ (Name of
Work) in full and final settlement of bill.

Contractor
(Signature of Contractor on Revenue stamp)
Rubber stamp/seal of the contractor /company

**LIFE INSURANCE CORPORATION OF INDIA
NORTHERN ZONAL OFFICE, NEW DELHI**

APPENDIX TO GENERAL INSTRUCTIONS TO CONTRACTORS**CLAUSE NO.2 :**

Name and Location of the Proposed work: CONSTRUCTION OF OFFICERS' QUARTER (3 NOS) AT JAITARAN (RAJ.)

CLAUSE NO.14 :

In addition to facilities, provided by the contractor under clause 14.1, in Office for Corporation's Engineer on Site, the contractor shall also provide computer with printer of suitable configuration as approved and directed by Site Engineer of Corporation.

SCOPE OF WORK :

Construction of Builder's Work, Interiors, Water Supply, Sanitary, Plumbing Work, Electrical Installation (Internal & External) including Ancillary Works, External Services works (pavement, Plinth protection, external drainage, water supply pumps, compound/ street light works), etc. as specified in Schedule Of Quantities.

SPECIAL CONDITIONS:

1. PHOTOGRAPHS OF THE BUILDING

- 1.1 The contractor shall submit 3 sets of the prints with soft copies of the photographs size 4"x6" to LIC of India on the following stages:
- a. Foundation work before plinth and back filling
 - b. Shuttering and reinforcement details floor wise before laying of concrete.
 - c. Completion stage of masonry work before plastering
 - d. After finishing but before painting
 - e. Completion before handing over the building.
- The photographs can also be submitted in CD/DVD.
- 1.2 One or more photographs shall be taken to have complete clear views of the project as directed by Corporation's Engineer. The further stage of work shall proceed only on confirmation of such photographs seen by LIC Engineers and a written site instructions obtained in this regard.
- 1.3 The quoted rates shall include for the same and no extra is payable to contractor on this account.

2. TESTING OF MATERIALS

During the progress of work, tests as prescribed below for various materials of construction shall be conducted as per the frequency noted in the table below. Contractor's attention is also drawn to Clause 9 of Conditions of Contract as well as Clause 9 of Preambles to Schedule of Quantities.

TABLE-A

Sl. No.	Materials	Test	Frequency
1.	Water	Chemicals & Physical properties for water	One test per source before commencement of work
2.	Sand (Fine Aggregates)	a) Slit content (field test) b) Gradation c) Bulking (Field test)	This is a routine test and should be carried out for sand for each consignment. Every 45 Cu.m or part thereof or whenever moisture content is doubtful.
3.	Stone (Coarse Aggregate)	a) Aggregate crushing value b) Gradation	One in beginning of stacking of materials thereafter for every change of source. Every consignment.
4	Cement	a) Initial & final setting time b) Compressive strength	One is being of stacking of materials thereafter for every change of source. One test for 100 tonnes or part there of and every changes of brand of cement if the cement is used for structural works.

Sl. No.	Materials	Test	Frequency
5.	Steel	1. Tensile strength a) Ultimate tensile stress b) Yield stress c) % Elongation	One test per category for every consignment used in work.
6.	Brick	a) Water absorption b) Efflorescence c) Compressive strength	One test for every 200000 Nos. or part thereof and for every change of brand (set of 5 bricks)
7.	Timber	a) Moisture content b) Specific gravity c) Species in sample of teak wood	One test for every 30cum or part thereof.
8.	Anodized coating of aluminum	Thickness of Anodic Coating.	One Test for material costing Rs.8.00 Lac.
9.	Marble mosaic tiles	a) Wet Transverse Strength b) Water Absorption c) Abrasion Test	One test for every 1 lakh tiles or part thereof.
10.	Flush Door	End Immersion Knife Adhesion	Destructive test based on no.of shutter. 1-100 one test 101-200 two test 201-500 three test 500 & above four test
11.	Ceramic Tiles/ Vitrified Tiles	Water absorption Crazing Test	One test for every 5000 nos. or part thereof.
12.	Marble	Moisture Absorption test	One test for every 800 sq.mt. or part thereof.
13.	Panel Door Shutter	a) Physical Test b) Glue Adhesion Test	One test from each lot. One test from each lot.
14.	Particle Board	a) Identification (Physical verification) b) Dimensional Tolerance	One test from each lot. One test from each lot.
15.	Sand Stone	Water absorption	One test from each lot.
16.	Cladding Stone	Water absorption	One test from each lot.

WATER

The Contractors shall be allowed use of water surplus to requirements of the Employer from existing wells or other source if any, on the site, but no guarantee is given that the quantity available shall be sufficient. In case, such water from the Employer's source is used, then water charges will be recovered from the Contractor's bill/s at the rate as mentioned in Sl.No 18 of "Appendix to the Conditions of Contract". The Contractor will make his own arrangements for plumbing and storing of water.

GENERAL PREAMBLES TO SCHEDULE OF QUANTITIES

These preambles apply to all the sections of the “Schedule of Quantities”.

1. RATE TO COVER :

- 1.1** The rates quoted by the contractor shall be held to include for providing and fixing, all conveyance and delivery, loading & unloading, carrying in, storing, hoisting, all labour, setting, fitting and fixing in position, making straight, cutting, waste, return of packing and all materials and labour and everything else necessary for the proper completion of each item of work to the approval of Corporation's Engineer and for Establishment Charges, overheads and profits. The Contractor shall provide at his expense all labour, materials and things required by the Corporation's Engineer for testing and measuring the work, for weighing, testing the efficiency of any portion of the work, all planking, gangways etc. necessary for affording access to every part of the work except where specifically stated otherwise.
- 1.2** The contractor should also cover in his rates for the method of work, cost of materials, labour etc., to comply with the “Trade Specifications”, General Instructions to Contractor”, “Conditions of Contract”, “Special Conditions”, (if any), and all documents of this contract.
- 1.3** All the materials or procedure or Specifications for work, unless otherwise stated, shall conform to the current Indian Standard whether or not specific mention is made thereof. The Contractor shall be responsible for and shall replace or make good at his own expense, any materials lost or damaged, or of quality not approved, temporarily disturbed roads, pavements, approaches, gates, walls or any such dismantling carried out to execute the work.
- 1.4** All rates quoted shall include for Supplying and fixing although the same may not have been mentioned in the item of the Schedule of Quantities. Words “Providing and Fixing where used shall have same meaning as “Supplying and Fixing”.
- 1.5** Rates quoted shall include for hoisting to any height, and all work at all levels and lift of materials shall not form any criterion for any extra claims, except where otherwise specified.

2. ANCILLARY WORKS :

- 2.1** The Contractor shall have to carry out all ancillary and connected work within and near vicinity of the plot of the proposed work and inside the Building if ordered to do so by the Chief Engineer at the rates given in the Schedule of Quantities, at any time during the currency of this Contract including extension of time, if any granted.

3. PRICE FLUCTUATION/VARIATION:

- 3.1** Rates quoted by the contractor shall be firm throughout the currency of the Contract including extensions of time, if any granted. No price adjustment due to variation in cost of materials or labour or any variation under any State or Central Legislation or any other reason whatsoever shall be allowed, except as stated in relevant clauses below with regard to variation in price on materials & labour and price fluctuation in Cement & Steel.

4. CEMENT :**CONTRACTOR'S QUOTED RATES:**

- 4.1** Contractor shall quote his overall Percentage Rates on the basis of provisions of this clause detailed hereunder and on the basis of the price of cement at site of work as mentioned in Annexure "P" attached herewith (hereinafter called the Basic Price of Cement).

APPROVAL OF SOURCE OF PURCHASE:

- 4.2** Contractor shall purchase cement from approved Cement Manufacturers/ such as ACC UltraTech, J. P. Rewa, Vikram, Shree Cement, Birla Jute, CCI, Madras cement, Chettinad cement, India cement etc. as approved by Ministry of Industry, Govt. of India and having license to use ISI Certification mark for their products and from C&F agents and authorized dealers (with dealership certificate). Cement shall be Ordinary Portland Cement 33 / 43 Grade of fresh manufacture conforming to IS: 269/ IS: 8112 respectively; Portland Pozzolana Cement: IS: 1489 (Part 2): 1991; Portland Slag Cement: IS: 455 (1989) or relevant Indian Standards (latest revision). Cement shall be purchased and transported to the work site by the contractor in bulk quantity required to achieve desired progress in next 3 months, from the above source of purchase (including brand of cement), At the time of starting the work, the request for approval shall be submitted within 15 days of receipt of tender acceptance letter. The contractor shall intimate the EE/SE the quantity of cement being procured, with the names, full addresses and telephone numbers of cement suppliers. For subsequent approvals the contractors shall approach Employer's Engineer at site at least 20 days in advance of the desired date of delivery of cement. The contractor shall submit his request for the approval through Employer's Engineer at site with one copy of the letter to EE/SE. The contractor's request letter shall mention the quantity of cement to be/ being purchased and also the quantity of cement in stock at site on the date of submitting the request.

BASIC PRICE OF CEMENT :

- 4.3** The Basic price of cement stated in Annexure "P" is inclusive of all costs up to the site of work, including purchase price, all levies and duties including excise duty, sales tax, Octroi / town duty, transportation charges including loading and unloading charges at all points (except unloading at site), transit insurance and any other expenses (expenditure) not mentioned above but

required etc., and shall be included by the contractor in his quoted rates. All other costs such as unloading the cement at site, handling, stacking, storage, providing watch and ward arrangements, loss due to pilferage, theft, damages if any including cement which may become unfit for consumption due to prolonged storage or due to rains etc. shall be to contractor's account and shall be included by the contractor in rates quoted in the tender.

QUALITY OF CEMENT :

- 4.4** The contractor shall satisfy himself that the cement arriving at site is ordinary port-land cement conforming to the requirement of IS: 269/8112 for 33/43 Grade respectively; Portland Pozzolana Cement: IS: 1489 (Part 2); Portland Slag Cement: IS: 455 (1989) or relevant Indian Standard and shall procure Manufacturer's Certificate to this effect. In case the contractor has any doubt regarding the quality of cement, it is up to him to have it tested at his own cost and make sure before incorporation in the works that the cement is of right quality. Each consignment of cement supplied should have Test Certificate of the Manufacturer.

4.5 CONTRACTOR'S OTHER RESPONSIBILITIES / LIABILITIES

- (i) Contractor shall comply with all requirements/procedures etc. that may be stipulated if any, by Government controlling authority from time to time and accordingly obtain the requisite supply of cement for the work.
- (ii) Even though the source of cement is approved by the employer but the employer shall not be responsible for quality of cement or any loss/ damage in transit, delays due to non-availability of cement with the factory/ C&F agents / authorized dealers and/or required transport etc. The contractor shall not be entitled to make any claim and EoT or Cost on the employer on such grounds.
- (iii) Cement shall be kept in custody of the contractor at site. The contractor shall be responsible for the safety of the cement by providing watch and ward as is necessary and directed. In case any cement is damaged, unaccounted for or lost due to pilferage or any other reason either in transit or at site, the accountability will be with contractor. If any quantity of cement is found in excess of requirement or left over after completion of the work, same shall not be removed from site without the written permission of the Engineer-in-charge.
- (iv) The contractor shall maintain a stock register at the site and shall record therein the receipt and consumption of cement, the same day it is received or consumed. He shall also get the entries in the register for receipt and consumption of cement countersigned by Employer's Site Engineer, on the same day cement is received or consumed.
- (v) Pozzolana/ Slag cement shall be used only if specifically permitted by the Chief Engineer. The Chief Engineer reserves the right not to allow the use of Pozzolana/ Slag cement. In case Pozzolana/ Slag cement is used, the

Contractor shall have to observe increased periods for striking form and additional period of one week for curing for which no claim shall be entertained.

- (vi) The cement shall be got tested by the Engineer-in-charge of employer as and when new consignment comes and there is change in manufacturer's brand. The contractor shall supply free of charge the cement required for testing including its transportation cost to testing laboratories. The cost of tests shall be borne by the contractor/Department in the manner indicated below:
 - (a) By the contractor, if the results show that the cement does not conform to relevant BIS codes.
 - (b) By the Department, if the results show that the cement conforms to relevant BIS codes.
- (vii) The contractor is allowed to use reasonable quantity from the cement brought at site for constructing temporary water storage tank to store water for construction, site office and godowns at site. The quantity used for this purpose shall not be accounted for payment due to price variation defined elsewhere.
- (viii) The actual issue and consumption of cement on work shall be regulated and proper accounts maintained. The theoretical consumption of cement shall be worked out as per procedure prescribed elsewhere in the contract. In case the cement consumption is less than theoretical consumption including permissible variation, recovery at the rate so prescribed shall be made. In case of excess consumption no adjustment shall be made.
- (ix) If the work executed is not conforming to acceptable standard as prescribed in the tender elsewhere, the work will not be considered for payment.

The damaged cement shall be removed from the site immediately by the contractor on receipt of a notice in writing from the Engineer-in-charge. If he does not do so within 3 days of receipt of such notice, the Engineer-in-charge shall get it removed at the cost of the contractor.

Chief Engineer may change the brand of Cement depending upon availability in local market, if needed. Instructions in this respect can be issued by them at regular intervals. The name of manufacturers will be finalized after taking into consideration the suggestions of contractors during pre bid meeting, if any.

Similar conditions for cement of other types like slag cement etc. may be incorporated wherever required by the authority by providing for relevant BIS Codes; suitable brands of cement and instructions issued by the department.

4.6 PAYMENT DUE TO VARIATION IN PRICES OF CEMENT

If after submission of the tender, the price of Cement specified in Annexure "P" increases/ decreases beyond the price(s) prevailing at the time of the last stipulated date for receipt of tenders including Tender opening extensions, if any for the work; then the variation in amount shall accordingly be paid and that any such variations shall be effected only for stipulated period of Contract including the justified contract period extended without imposition of liquidated clauses.

However for work done/during the justified period extended as above, it will be limited to indices prevailing at the time of stipulated date of completion or as prevailing for the period under consideration, whichever is less.

The increase/decrease in prices of cement, shall be determined by the Price indices as published by Economic Advisor to Government of India, Ministry of Commerce and Industry and base price for cement, as indicated in Annexure 'P' as valid on the last stipulated date of receipt of tender, including extension if any and for the period under consideration.

The amount will be worked out as per the formula given below for individual material :-

Adjustment for component of cement.

$$V = P \times Q \times \frac{CI - Clo}{Clo}$$

where,

V = Variation in Cement cost i.e, increase or decrease in the amount to be paid or recovered.

P = Base Price of cement as indicated in Annexure 'P' valid at the time of the last stipulated date of receipt of tender including extensions, if any.

Q = Quantity of Cement consumed in the works since previous bill.

Clo = All India Whole Sale Price Index for cement, as issued by Office of the Economic Advisor, Dept. of Industrial Policy & Promotion under Ministry of Commerce and Industry, Government of India as valid on the last stipulated date of receipt of tenders including extensions, if any.

CI = All India Whole Sale Price Index for cement, as issued by Office of the Economic Advisor, Dept. of Industrial Policy & Promotion under Ministry of Commerce and Industry, Government of India for period under consideration.

5. MILD STEEL BARS AND HIGH STRENGTH DEFORMED BARS FOR REINFORCEMENT IN R.C.C. WORK TO BE SUPPLIED BY CONTRACTORS :

5.1 CONTRACTOR'S QUOTED RATES:

Contractor shall quote his rates for various relevant items in the tender on the basis of provisions of this clause detailed hereunder and on the basis of the price of steel at site of work as mentioned in Annexure "P" attached herewith (hereinafter called the Basic Price of Steel).

5.2 APPROVAL OF SOURCE OF PURCHASE:

- (1) The contractor shall procure TMT bars of Fe415/ Fe500 grade (the grade to be procured is to be specified) from primary producers such as SAIL or TISCO or RINL as approved by Ministry of Steel. The TMT bars procured from primary producers shall conform to manufacturer's specifications. In case of non-availability of steel from primary producers, the approving authority may permit use of TMT reinforcement bars procured from secondary producers. In such cases following action is to be followed:
 - (a) The grade of the steel such as Fe415/Fe500 or other grade to be procured is to be specified as per BIS 1786/2008.
 - (b) The secondary producers must have valid BIS licence to produce HSD bars conforming to IS 1786: 2008. In addition to BIS licence, the secondary producer must have valid licence from either of the firms Tempcore, Thermex, Evcon Turbo & Turbo Quench to produce TMT Bars.
 - (c) The TMT bars procured from primary producers shall conform to manufacture's specifications.
 - (d) The TMT bars procured from secondary producers shall conform to the specifications as laid by Tempcore, Thermex, Evcon Turbo & Turbo Quench as the case may be.
 - (e) TMT bars procured either from primary producers or secondary producers, the specifications shall meet the provisions of IS 1786 : 2008/2012 pertaining to Fe415D or Fe 500D grade of steel as specified in the tender (while preparing Tender the grade of the steel to be specified).
- (2) The contractor shall have to obtain and furnish test certificates to the Engineer-in- charge in respect of all supplies of steel brought by him to the site of work.
- (3) Samples shall also be taken and got tested by the Engineer-in-Charge as per the provisions in this regard in relevant BIS codes. In case the test results indicate that the steel arranged by the contractor does not conform to the specifications as defined under para (1)(d) & (1)(e) above, the same shall stand rejected, and it shall be removed from the site of work by the

contractor at his cost within a week time or written orders from the Engineer-in-Charge to do so,

- (4) The steel reinforcement bars shall be brought to the site in bulk supply required to achieve desired progress of the work in next 3 months, from the above source of purchase (including brand of steel) as decided by the Engineer-in-charge. At the time of starting the work, the request for approval shall be submitted within 15 days of receipt of tender acceptance letter. The contractor shall intimate the EE/SE the quantity of steel being procured, with the names, full addresses, and telephone numbers of steel suppliers. For subsequent approvals the contractors shall approach Employer's Engineer at site **at least 20 days** in advance of the desired date of delivery of steel. The contractor shall submit his request for the approval through Employer's Engineer at site with one copy of the letter to EE/SE. The contractor's request letter shall mention the quantity of steel to be/ being purchased and also the quantity of steel in stock at site on the date of submitting the request.
- (5) The steel reinforcement bars shall be stored by the contractor at site of work in such a way as to prevent their distortion and corrosion, and nothing extra shall be paid on this account. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.
- (6) For checking nominal mass, tensile strength, bend test, re-bend test etc. specimens of sufficient length shall be cut from each size of the bar at random, and at frequency not less than that specified in the tender.

5.3 BASIC PRICE OF STEEL

The basic price of steel stated in Annexure 'P' is inclusive of all costs upto the site of work, including purchase price, all levies and duties including excise duty, sales tax, octroi / town duty, transportation charges including loading and unloading charges at all points (except unloading at site), transit insurance, and any other expenses (expenditure) not mentioned above but required etc. and shall be included by the contractor in his quoted rates. All other costs such as unloading the steel at site, handling, stacking, storage, providing watch and ward arrangements, loss due to pilferage, thefts or any other reasons shall also be to contractor's account and shall be included by the contractor in rates quoted in the tender.

5.4 QUALITY OF STEEL

The contractor shall satisfy himself that the steel arriving at site is TMT bars of Fe415/ Fe500 grade as per BIS 1786-2008/2012 or other grade bars procured either from primary producers or secondary producers, the specifications shall meet the provisions of IS 1786 : 2008/ 2012 pertaining to Fe 415D or Fe 500D grade of steel as specified in the tender and shall be supported by test certificate from the suppliers. In case the contractor has any doubt regarding the quality of steel, it is up to him to have it tested at his own cost and make sure before incorporation in the works that the steel is

of right quality. Each consignment of steel supplied should have Test Certificate of the Manufacturer.

5.5 CONTRACTOR'S OTHER RESPONSIBILITIES/ LIABILITIES

- (i) Contractor shall comply with all requirements/procedures etc. that may be stipulated if any, by Government/ controlling authority from time to time and accordingly obtain the requisite supply of steel for the work.
- (ii) Even if the source of steel is approved by the employer, the employer shall not be responsible for quality of steel, correctness of diameter/ size or any loss/ damage in transit, delays due non availability of steel with the manufacturer/suppliers and/or required transport etc. The contractor shall not be entitled to make any claim & Extension of Time or Cost on the employer on such grounds.
- (iii) The contractor shall be responsible for proper storing arrangement at site. Steel shall be kept in custody of the contractor at site. The contractor shall be responsible for the safety of the steel by providing watch and ward as is necessary and directed. In case any steel is damaged, unaccounted for or lost due to pilferage or any other reasons either in transit or at site, the accountability will be with contractor. If any quantity of steel is found in excess of requirement or left over after completion of the work, same shall not be removed site without the written permission of the Engineer-In-charge.
- (iv) The contractor shall maintain a stock register at the site and shall record therein the receipt and consumption of steel (category wise), the same day it is received or consumed. He shall also get the entries in the register for receipt and consumption of steel countersigned by Employer's Site Engineer, on the same day steel is received or consumed.
- (v) The wastage shall be to contractor's account and shall be taken away by the contractors after obtaining written permission from the Engineer-in-charge and the rates quoted shall allow for the same.
- (vi) The payment of steel reinforcement shall be made on weight worked out on the basis of measurement of lengths of various categories as incorporated in the work and sectional weights mentioned in tender.
- (vii) The contractor shall obtain a test certificate from the manufacturer for the lot of steel purchased for the work. The employer's site Engineer may also order testing of steel when new consignment comes and/ or there is change in manufacturer's brand, by the contractor before allowing its use in the work irrespective of the test certificate and in such case the contractor shall supply free of charge the steel required for testing including its transportation cost to testing laboratories, The cost of tests shall be borne by the contractor/Department in the manner indicated below but not any other incidental expenses for arranging the testing, which shall be to contractor's account and included in quoted rates.

- (a) By the contractor, if the results show that the steel does not conform to relevant BIS codes.
- (b) By the Department, if the results show that the steel conforms to relevant BIS codes.
- (viii) The actual issue and consumption of steel on work shall be regulated and proper accounts maintained. The theoretical consumption of steel shall be worked out as per procedure prescribed elsewhere in the contract. In case the steel consumption is less than theoretical consumption including permissible variation, recovery at the rate so prescribed shall be made. In case of excess consumption no adjustment shall be made.
- (ix) The substitution of any category of steel shown in drawing with other category of steel shall be done only if permitted by the EE/SE in writing.
- (x) The steel brought to site and the steel remaining unused shall not be removed from site without the written permission of the Engineer-in-charge.

5.6. Payment due to variation in prices of Steel

If after submission of the tender, the price of Steel specified in Annexure "P" increases/ decreases beyond the price(s) prevailing at the time of the last stipulated date for receipt of tenders including Tender opening extensions, if any for the work, then the variation in amount shall accordingly be paid and that any such variations shall be effected only for stipulated period of Contract including the justified contract period extended without imposition of liquidated clauses.

However, for work done/ during the justified period extended as above, it will be limited to indices prevailing at the time of stipulated date of completion or as prevailing for the period under consideration, whichever is less. The increase/ decrease in prices of steel, shall be determined by the Price indices as published by Economic Advisor to Government of India, Ministry of Steel and base price for steel, as indicated in Annexure 'P' as valid on the last stipulated date receipt of tender, including extension if any and for the period under consideration.

The amount will be worked out as per the formula given below for individual material:

Adjustment for component of steel,

$$V = P \times Q \times \frac{(C_1 - C_0)}{C_0}$$

where,

V = Variation in Steel cost i.e. increase or decrease in the amount to be paid or recovered.

P = Base Price of steel as indicated in Annexure 'P' valid at the time of the last stipulated date of receipt of tender including extensions, if any.

Q = Quantity of Steel consumed in the worksite i.e. as measured and recorded since previous bill. Wastage, if any, to be on contractor's account.

Clo = All India Whole Sale Price Index for steel, as issued by Office of the Economic Advisor, Dept. of Industrial Policy & Promotion under Ministry of Commerce and Industry, Government of India as valid on the last stipulated date of receipt of tenders including extensions, if any.

CI = All India Whole Sale Price Index for steel, as issued by Office of the Economic Advisor, Dept. of Industrial Policy & Promotion under Ministry of Commerce and Industry, Government of India for period under consideration.

6. WASTAGE OF CEMENT AND STEEL :

6.1 The wastage of Cement and Steel shall be to the contractor's Account and the rates quoted shall allow for the same.

7. BALANCE STOCK OF CEMENT/STEEL ON COMPLETION OF JOB :

7.1 Irrespective of what is mentioned anywhere else in this tender the surplus stock of Cement/Steel remaining at the site on completion of work, shall be the property of the Contractor. However, he shall remove the surplus stock only after furnishing the necessary details of such stock in writing to the Corporation's Engineer and obtaining permission from him.

8. STEEL OTHER THAN USED FOR REINFORCEMENT :

8.1 Rolled steel sections such as angles, joists, channels, flats etc. and mild steel used for M.S. Grills, railing, gates and M.S. Plates etc., shall be procured by the Contractor and Annexure "P" will not apply for cost of these items.

9. TESTING OF MATERIALS INCLUDING CEMENT AND STEEL :

9.1 Testing of all materials including cement & steel during the progress of work shall be as per frequency given in Table A, Clause 2 of Special Conditions.

9.2 Contractor shall facilitate testing of materials viz., Cement, Steel, Cubes and any other material as per the frequency / sampling mentioned in the Table 2 of the Special Conditions. Contractor shall also facilitate testing of any material to be incorporated in work even if it is not specifically mentioned. The testing charge against invoice shall be directly remitted by the corporation to the test house. If the material/s fails to conform to the standards, the test charges shall be recovered from contractor's bill.

- 9.3** For all other materials listed in Special Conditions, expenses towards testing shall be borne by LIC . If the material/s fails to conform to the standards, the test charges shall be recovered from contractor's bill.
- 9.4** The Corporation's Engineer may get tested any material to be incorporated in work even if it is not specifically mentioned. In all such cases, testing charges will be borne by LIC. If the material/s fails to conform to the standards, the test charges shall be recovered from contractor's bill.
- 9.5** For all tests incidental charges such as cutting, loading, unloading, casting wherever applicable such as mortar briquettes / cubes and facilitating in transportation, shall be borne by contractor.
- 10. "PRINCIPAL MAKE/S OR OTHER EQUAL AND APPROVED" FOR MATERIALS/ PRODUCTS :**
- 10.1** The Contractor shall note that materials having "ISI" monogram shall primarily be used in the work. If in the tender "Certain Principal Make / Makes or other equal and approved of any material/Product is mentioned in any item or Trade Preambles relating to the particular items in its respective Trade Schedule, the Contractor shall have to use the Principal Make/Makes specified in the relevant item or the trade Preambles. In case the specified particular Principal make/makes of the materials product is/are not readily available, the Contractor shall take prior permission and approval of the Chief Engineer in writing before use of the alternative equivalent make of the Material / Product.
- 10.2** All principal makes specified for any item shall be treated at par as per the accepted quoted rate.
- 10.3** Use of the make other than the Principal Make/Makes (which shall be treated as an Equivalent make) shall be at the discretion of the Chief Engineer and such Make/Makes shall be used after the approval of the Chief Engineer.
- 10.4** In such cases the Contractor will not be paid any extra payment over the accepted quoted rate in any case. However if it is ascertained that the price of approved Equivalent Make or the Material/Product is lower than that for the Principal Make/Makes of the same material/product the difference of the price shall be payable by the contractor to LIC. Such difference of price shall be suitably decided by the Chief Engineer whose decision shall be final and binding to the Contractor in this regard.
- 11. ADJUSTMENT IN PRICES OF MATERIALS AND LABOUR (OTHER THAN CEMENT & STEEL) :**
- 11.1** Adjustment in price of material, labour shall apply to original civil work for construction of building which may include piling, plumbing & sanitary work, electrical installations and which shall have a stipulated completion period of more than six months. The adjustment in prices under this clause shall not apply to works such as tube-well, lifts, air-conditioning, and substation

equipment, any other plant & machinery, interior work, repair & maintenance contracts unless otherwise specified.

- 11.2** Adjustment shall be made only for tender items and deviated items for the stipulated contract period.
- 11.3** Adjustment in prices of material & labour for the work executed within the stipulated scheduled date of completion shall be allowed on the basis of clause-11.7, 11.8, 11.9 and 11.10.
- 11.4** Adjustment in prices of material & labour for the work executed beyond the stipulated scheduled date of completion shall be allowed on the basis of clause-11.7, 11.8, 11.9 and 11.10, subject to the conditions given below.
- 11.5** (a) If the Contractor is granted Authorized Extension of Time beyond the Scheduled Date of Completion without imposition of Liquidated Damages then the Contractor shall be entitled for Adjustment for Variation in Prices of Labour and Material with prevailing index for the work executed during the extended period.
- (b) If the Contractor is granted Extension of Time beyond the Scheduled Date of Completion, but with imposition of Liquidated Damages then the Contractor shall be entitled for Adjustment for Variation in Prices of Labour and Material by considering index as that prevailing on the Scheduled Date of Completion or that prevailing on the date of billing, whichever is lower, for the work executed during the extended period.
- (c) If the Contractor is granted Extension of Time beyond the Scheduled Date of Completion and if the delay is due to the failure on the part of the contractor but, due to reasons beyond his control and Liquidated Damages are not imposed, then the Contractor shall not be entitled for Adjustment for Variation in Prices of Labour and Material for the work executed during the extended period.
- 11.6** For considering the value of adjustment for Price Variation of LABOUR/ MATERIALS during the extended period beyond stipulated date of completion as mentioned in the tender documents, the Average All India Whole Sale Price Index (W) for all commodities / All India Consumer Price Index for industrial workers shall be considered as detailed above.

ADJUSTMENT OF MATERIALS :

- 11.7** For the purpose of adjustment in price of materials, the component shall be 60% of the value of work done up to a given stage. While computing the adjustment, the cost of cement, steel or any other materials for which basic price has been stipulated in the tender shall be deducted from the component worked out at 60% of the value of work.

The cement and steel as covered under Clauses 4 and 5 of the General Preambles to schedule of quantities shall be excluded from the purview of the adjustment.

$$V_m = \left\{ 60/100 (R_n - R_{n-1}) - C_m - M_{n-1} + M_n \right\} \times \frac{(W - W_0)}{W_0}$$

Where,

V_m = Variation in price for materials i.e. increase or decrease in the amount in rupees to be paid or recovered.

R_n = Total value of work done (excluding prime cost items, extra items and advance on materials at site up to the period under reckoning) on the basis of accepted tender rates. The deviated items worked out fully on the basis of rates prevailing at the time of last date of receipt of tender to be included.

C_m = (C + S + Br) i.e. Total value of cement and steel at basic price stipulated in the tender and cost of items with Basic Rates fixed in schedule of Quantities and shall comprise of C & S and Br as explained below :

C = Cost of cement used in the work and recorded for any specific bill period under reference and worked out at basis price stipulated in Annexure "P" attached in the tender.

S = Cost of steel for reinforcement (covered under Clause 5.1 AND 5.2 of the General Preambles to schedule of quantities) used in the work and recorded for any specific bill period under reference and worked out at issue price / basis price stipulated in the tender.

Br = Cost of Material with Basic Rates fixed and mentioned with description of items in Schedule of Quantities, which shall be calculated by multiplying the quantity of material used in work by Basic Price of material mentioned in relevant tender item.

R_{n-1} = Total value of work done (excluding prime cost items, extra items and advance on materials at site) considered in the bill prior to the period under reckoning. The deviated items and such other items shall be considered as per R_n above.

M_n = Advance being allowed in the bill under consideration against materials at site (other than cement and steel)

M_{n-1} = Advance allowed in the bill prior to the period under scrutiny against materials at site (other than cement and steel)

W_0 = All India Wholesale Price Index for all commodities (Base = 100; Year 2004-05) as prevailing on the last day for submission of tender (including extended date, if any).

W = Average All India Wholesale Price Index for all commodities (Base = 100; year 2004-05); as published in the RBI Bulletin for the period of the bill under consideration viz. from the date of previous bill (date of commencement in case of first bill) to date of current bill (date of virtual completion in case of final bill or any earlier cut off date as fixed).

- 11.8** The adjustment on materials is worked out on the basis that material component in the building construction work is 60% of the value of work done, the rest being labour and profit. But in the initial stages of construction work, it might so happen that the cost of materials used exceeds 60% which is taken as an average and therefore adjustment gets worked out on negative side even though the economic index might have gone up. In such cases, the negative adjustment shall also have to be made in the bill.

ADJUSTMENT OF LABOUR :

- 11.9** The contractor shall pay wages to the skilled and unskilled labour not less than the rates prescribed under the minimum wages act and as stated in clauses no. 18 of the General Instructions to contractors for Builders work. Variation in prices of labour shall be worked out by applying the following formula and necessary payment/ recovery made :

$$V_L = 25/100 \times (R_n - R_{n-1}) \times (I - I_0) / I_0$$

V_L = Variation in price for labour i.e. increase or decrease in the amount in rupees to be paid or recovered.

I = Average All India Consumer Price Index for Industrial Workers (base 100 year - 2001) declared by Labour Bureau, Govt. of India, as published in Reserve Bank of India Bulletin during the period under reckoning.

Average All India consumer Price Index for Industrial workers for the period of the bill under consideration viz. from date of previous bill (date of commencement in case of first bill) to date of current bill (date of virtual completion in case of final bill or any earlier cut off date as fixed)

I_0 = All India Consumer Price Index for Industrial Workers (base 100 year- 2001) ruling on the last date of submission of tender (including extended date, if any)

R_n = As defined under 11.7 above

R_{n-1} = As defined under 11.7 above

- 11.10** If the last date for submission of tender / date of bill is between 1st to 15th of a particular month the relevant economic index (W , W_0 , I , I_0) for the previous month is to be considered. However, if the last date of submission of tender/

date of bill is between 16th and end of month, the relevant economic index for the month shall be reckoned while calculating the material/labour price adjustment.

- NOTE** :
- 1) The adjustment in prices of Materials and Labour shall be considered / effected only when the Contractor submits authentic data for prevailing indices along with the RA/Final Bill. The Employer reserves the right to set aside certain amount from the Bill if the Contractor does not submit the authentic data of prevailing indices along with the bill.
 - 2) For adjustment in prices of materials & labour the indices (WPI/CPI) published by RBI as mentioned above which are available as on the date of submission of final bill (final / provisional indices) will only be considered for settlement of final bill. No further review will be done, even if there are variations in indices (WPI/CPI) after the final bill is settled.
 - 3) In case during the period of contract, the base years for publishing Economic Indices are changed as per statute, then the revised indices will be considered as per the published data available at the time of setting the bill/s.

Name of the work:

Annexure M-1

Abstract Bill No.

TI No.	Tender Qty.	Brief Description	Quantity			Unit	Rate	Amount (Rs.)
			Last Bill	This Bill	Actual Total			
1.01								
1.02								
1.03								

Deviated items :

Net value after rebate :

Value Extra items

Value escalation on material

Value escalation on labour

Value escalation on Cement

Value escalation on Steel

Total value of work done :

Advance for material at site

Any miscellaneous reimbursement charges, cube testing charges.

Devaluation if any

Total value of Work done Rs.

Deductions

IT on value of Work Done

WCT @% on value of work done

Labour Cess @% on value of work done

Cement consumed in the work

RMD

Recovery of any other material if any

Recovery of waterproofing items

Recovery of electricity

Recovery of Insurance lapses & liquidity damages

Amount released in earlier Bills

Total recoveries

Net Amount Payable Rs.

ANNEXURE “P”

1. BASIC PRICE OF CEMENT at the Work-Site.
(Refer Clause No. 4.3 of the General Preambles to Schedule of Quantities).

Rates as given in schedule of quantities shall be Based on the BASIC PRICE of Cement at the work-site which includes purchase price of Cement, all Levies and duties such as Excise Duty, Sales Tax, Octroi/Town duty, Transportation charges from the factory / C&F Agent godown to the work – site, loading and unloading charges at all points (except unloading at the work – site), transit insurance etc.

A) Ordinary Portland Cement : Rs.5300.00 PER M.T. (RS. FIVE THOUSAND THREE HUNDRED ONLY) PER M.T.

2. BASIC PRICE OF STEEL at the Work – Site :
(Refer clause No. 5.3 of the General Preambles of Schedule of Quantities)

Rates as given in schedule of quantities shall be based on the BASIC PRICE of Steel at the Work-Site which includes purchase price of Steel, all Levies and Duties such as Excise Duty, Sales Tax, Octroi/Town Duty, Transportation Charges from the manufacturer godown to the work-site including bending and binding charges at all points (except unloading at the work-site), Transit Insurance, Weighment charges, etc.

A) TMT/ High Strength Deformed Bars manufactured by Primary Producers of all diameters in coil or in straight lengths	Rs. 37,000.00 PER M.T. (Rs. Thirty Seven Thousand Only) PER M.T.
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Note :

1. The increase/ decrease in prices of Cement and Steel shall be determined by the All India Whole Sale Price Index for Cement and Steel, as issued by Office of Economic Adviser, Dept. of Industrial Policy and Promotion under Ministry of Commerce and Industry, Government of India as per the formula given in the Tender.
2. Packing of Cement (like gunny bags, polythene bags etc.) cost of which is included in the purchase price, shall BE THE PROPERTY OF THE CONTRACTOR.

ANNEXURE “Q”**NOTE REGARDING STATEMENT SHOWING QUANTITIES OF THEORETICAL
CONSUMPTION OF CEMENT FOR MAJOR ITEMS OF WORKS**

NOTE: Refer to the latest CPWD specification and norms for Coefficient of Cement Consumption. In case no Coefficient is available for a specific item the decision of Chief Engineer, shall be final and binding on the contractor.

ANNEXURE – “R”**LIFE INSURANCE CORPORATION OF INDIA****FORM OF GUARANTEE FOR WATERPROOFING**

(To be given by Waterproofing Agency)

Name of the work : _____

Name of the Main contractor : _____

Name of Water Proofing Agency

M/s. _____

We M/s. _____

_____ hereby guarantee that the surfaces treated by us for waterproofing in the above work, for M/s. _____ the General builders Contractors for the above work, shall remain entirely watertight, Should, however, due to any unforeseen defect left out in the work carried out by us at the time of execution of the work, there be any leakage from any surface treated by us during the period of **ten years** from the date of virtual completion of work i.e. from _____ to _____ the same shall be rectified by us without any cost to the Life Insurance Corporation of India.

However, we shall not be responsible in any way if our work is tampered with or if the body of the structure is damaged due to sinking, cracking and/or by any other act of God.

The intimation received from LIC of India during Guarantee period shall be deemed to have been received from Main Builder's Contractor and inspection as well as necessary work shall be carried out and reported upon by us forthwith.

Signature of Waterproofing Agency**Signature of the Main Builders' Contractor**

ANNEXURE - "T "**(PROFORMA OF GUARANTEE FOR ANTI-TERMITE TREATMENT)**
(To be given on stamp paper of Rs. 10/-)

Name of the firm/Company & its address :-

To,

The L.I.C. of India,

Dear Sirs,

Sub:- Pest control – Pre construction anti termite treatment
Treatment – Guarantee regarding _____

We hereby certify that the foundation's and structure/s of the premises of the Life Insurance Corporation of India described in the schedule below, have been pre-treated by us against subterranean termite infestation in accordance with our procedure for pre-treatment set out in our letter/s No..... dated..... And in accordance with the terms and conditions under which the said works are carried out.

2. We hereby guarantee that the foundation/s structure/s of the said premises of the L.I.C. of India, shall be safe against subterranean or infestation for a period of 5 years from
To..... (FIVE)

3. In the event of said structure/s and foundations of the premises of the L.I.C. of India being or becoming subject to subterranean termite attack or infestation at any time during the guaranteed period of 5 years, we agree to carry out as often as it becomes necessary, at our cost and expenses all and every treatment that may be necessary to render the said foundation/s and structure/s free from such subterranean termite attack or infestation.

3. The question whether the foundation/s and structure/s of the premises are or become subject to subterranean termite attack or infestation and whether any anti termite is or has become necessary shall be decided by the L.I.C. of India and we agree that their decision in this regard shall be final and binding on us.

Yours faithfully,

Signature of specialized
Agency / firm with seal.

Signature of Bldg. Contractor who have done the Builder's work.

ANNEXURE – ‘E’**PROFORMA OF BANK GUARANTEE IN LIEU OF EARNEST MONEY DEPOSIT**

(Refer clause 10 of Instructions in regard to Submission of Tenders in Part -II)

(On Non-Judicial Stamp Paper to be stamped in accordance with stamp act, the stamp paper to be the name Executing Bank)

Ref:

Date:

Bank Guarantee

No.....

To

THE LIFE INSURANCE CORPORATION OF INDIA

Dear Sir,

In consideration of Life Insurance Corporation of India having its Zonal Office at New Delhi in state of Delhi (Herein after called the "the Corporation" which expression shall unless repugnant to be the subject or context include its successors and assigns) having issued Direct Tender Notice for the work of

M/s.....

Having its Registered / Head Office at

(Herein after called the "Tenderer" who wishes to participate in the said tender for

And you, have agreed to accept an irrevocable and unconditional Bank Bid Guarantee for the and amount of Rs.....

(Rupees..... valid up to on behalf of the tenderer in lieu of Earnest Money Deposit required to be made by the tenderer, as a condition precedent for participation in said tender.

We, the Bank incorporated under law and having one of our branches at and having our Registered Office/ Head office at do hereby unconditionally and irrevocable guarantee and undertake to pay to the "Employer" immediately on demand without any demur reservation, protest, contest and recourse to be extent of the said sum of Rs.....(Rupees only).

Any such claim/ demand made by the said "Employer" on us shall be conclusive and binding on us irrespective of any dispute or difference raised by the tenderer. This guarantee shall be irrevocable and shall remain valid up to If any further extension of this guarantee is required, the same shall be granted to such required period on receiving instructions from M/s to whose behalf this guarantee is issued.

We, the said Bank undertake not to revoke this guarantee during its currency except with the previous consent of the employer in writing and agree that any change in the constitution of the said tenderer or the said Bank shall not discharge our liability hereunder. In witness whereof the Bank, through its authorized officer, has set its hand and stamp on this day of 20 at

WITNESS

1. (SIGNATURE)
(NAME).....

(SIGNATURE)
(NAME).....
(Designation with Bank Stamp)

(OFFICIAL ADDRESS)
.....
.....

ATTORNEY AS PER
POWER OF ATTORNEY NO.....
DATE.....

2. (SIGNATURE)
(NAME).....

(OFFICIAL ADDRESS)
.....
.....

ANNEXURE – 'I'**PRE CONTRACT INTEGRITY PACT****General:**

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on..... day of the month of201 , between, on one hand, the Life Insurance Corporation of India (hereinafter referred to as "LIC") a statutory Corporation established under section 3 of Life Insurance Corporation Act 1956 (XXXI of 1956) and having its corporate office at "Yogakshema" Jeevan Bima Marg Mumbai 400021. (hereinafter called the "BUYER" which expression shall mean and include, unless the context otherwise requires, his successors in office assigns) of the First part. And M/s represented by Shri..... .(hereinafter called the "BIDDER /SELLER" which expression shall mean and include , unless the context otherwise requires, his successors and permitted assigns) of the Second part.

WHEREAS the BUYER proposes to **Construct the OFFICERS' QUARTERS BUILDINGat JAITARAN (RAJ.)** and the BIDDER/Seller is willing to offer/has offered to **Construct the OFFICERS' QUARTERS BUILDINGat JAITARAN (RAJ.)** and

WHEREAS the BIDDER is a private company/public company/Government undertaking/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is performing its function under the LIC Act 1956.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

Enabling the BUYER to **Construct the OFFICERS' QUARTERS BUILDINGat JAITARAN (RAJ.)** at a competition price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERS to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and

the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:-

Commitments of the BUYER

- 1.1** The BUYER undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either themselves or for any person, organisation or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting on implementation process related to the contract.
- 1.2** The BUYER will, during the pre-contract stage, treat all BIDDERS alike and will provide to all BIDDERS the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERS.
- 1.3** All the officials of the BUYER will report to the appropriate "CVO" any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

2. In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

Commitments of BIDDERS

3. The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the

contract or in furtherance to secure it and in particular commit itself to the following:-

- 3.1** The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.
- 3.2** The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract of any other contract with the government for showing or forbearing to show favour or disfavor to any person in relation to the contract of any other contract with the Government.
- 3.3** Foreign BIDDERS shall disclose the name and address of their Indian agents and representatives in India, and Indian BIDDERS shall disclose their foreign BUYERS or associates.
- 3.4** BIDDERS shall disclose the payments to be made by them to their agents/brokers or any other intermediary, in connection with this bid/contract.
- 3.5** The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacturer/ integrator/authorized agent of the stores/equipment/items and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

3.6 The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.

3.7 The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

3.8 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

3.9 The BIDDER/Contractor will not commit any offence under the relevant India penal code (IPC) /Provision of corruption (PC) act .Further improperly , for purposes of competition or personal gain, pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.

3.10 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

3.11 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

3.12 If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filing of tender.

The term 'relative' for this purpose would be as defined in section 6 of the Companies Act 1956.

3.13 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee or the BUYER.

4. Previous Transgression

4.1 The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify; BIDDER's exclusion from the tender process.

4.2 The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. Earnest Money (Security Deposit):

5.1 While submitting commercial bid, the BIDDER shall deposit an amount Rs..... (to be specified in RFP/Tender) as Earnest Money as applicable/Security Deposit, with the BUYER through any of the following instruments:

- (i) Bank Draft of Pay Order in favour of LIC.
- (ii) A confirmed guarantee by an Indian Nationalized Bank, promising payment of the guaranteed sum to the BUYER on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the BUYER shall be treated as conclusive proof of payment.
- (iii) Any other mode or through any other instrument (to be specified in the RFP/Tender).

5.2 The Earnest Money /Security Deposit shall be valid up to the complete conclusion of the contractual obligations to the complete satisfaction of both the BIDDER and the BUYER, including warranty period, which ever is later.

5.3 In case of the successful BIDDER a clause would also be incorporated in the Article pertaining to Performance Bond in the Purchase Contract that the provisions of sanctions for Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the BUYER to

forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

5.4 No interest shall be payable by the BUYER to the BIDDER on Earnest Money/Security Deposit for the period of its currency.

6. Sanctions for Violations:

6.1 Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required:-

(i) To immediately call off the pre contract negotiations without assigning any reason or giving any; compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would continue.

(ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/ Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.

(iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

(iv) To recover all sums already paid by the BUYER, and in the case of an Indian BIDDER with interest thereon at 2% above the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2% above the LIBOR (London Inter Bank Offer Rate). If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.

(v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.

(vi) To cancel all or any other contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/recission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.

(vii) To debar the BIDDER from participating in the future bidding processes of LIC for a minimum period of five years which may be further extended at the discretion of the BUYER.

(viii) To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.

(ix) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.

(x) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this pact.

6.2 The BUYER will be entitled to take all or any of the actions mentioned at para 6.1(i) to (x) of this pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

6.3 The decision of the BUYER to the effect that a breach of the provisions of this pact has been committed by the BIDDER shall be final and convulsive on the BIDDER. However, the BIDDER can approach the Independent Monitor(s) appointed for the purposes of this Pact.

7. Fall Clause:

7.1 The BIDDER undertakes that it has not supplied/is not supplying similar product/systems/items or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or subsystems/items was supplied by the BIDDER to any other Ministry/Department of the Government of India or PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the BIDDER to the BUYER, if the contract has already been concluded.

8. Independent Monitors:

8.1 The BUYER has appointed (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission.

Name address of the Monitor(s):

✱

✱

8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

8.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently. It will be obligatory for him to treat the information & documents of the Bidder /Contractor as confidential.

8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

8.5 As soon as the Monitor notices, or has reason to believe, a violation of this pact, he will so inform the Authority designated** by the BUYER.

8.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

8.7 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8.8 The Monitor will submit a written report to the designated authority** of BUYER /Secretary in the Department/ within 8 to 10 weeks from the date of reference or intimation to him by the BUYER /BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

9. Facilitation of Investigation:

In case of any allegation of violation of any provisions of this pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER. The BIDDER shall provide necessary information and documents in English and shall extend all possible help of the purpose of such examination/inspection.

10. Law and Place of Jurisdiction:

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the BUYER.

11. Other Legal Actions:

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extent law in force relating to any civil or criminal proceedings.

12 Validity:

12.1 The validity of this Integrity Pact shall be from date of its signing and extend upto 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

12.2 Should one or several provisions of this Pact turn out to be invalid; the remainder of this pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13. The parties hereby sign this Integrity Pact at.....on.....

BUYER **LIC of India**

BIDDER

Name of the Officer:

CEO

Designation : **Chief Engineer**

Deptt./MINISTRY/PSU : **Engineering Department**

NZO, New Delhi

Witness

1.....

1.....

2.....

2.....

(* Provisions of these clauses would need to be amended/deleted in line with the policy of the BUYER in regard to involvement of Indian agents of foreign suppliers.)

(** Please specify the "Name of Authority" in place of "Authority Designated" wherever mentioned in the Agreement)

Note: The name of monitor(s) shall be intimated separately for your information as the same is not available with us at present.

LIST OF PRINCIPAL MAKES / AGENCIES / BRANDS OF VARIOUS MATERIALS

1. Materials used in the work should be from the following list of principal makes/ brands. In case of non-availability of these makes/brands, Chief Engineer shall allow materials licensed by BIS bearing "ISI" monogram at par with principal makes.
2. For all other manufactured materials for which principal makes are not mentioned the materials allowed to be used in the work shall have BIS certification and samples for which are to be got approved prior to use of the same in the work.
3. For some materials BIS certification may not be available. In such cases the samples shall have to be got approved before using in the work.

Sl. No	MAKES / AGENCIES / BRANDS	Sl. No.	MAKES / AGENCIES / BRANDS
1.	Ordinary Portland Cement/ Pozzolana Portland Cement	2.	Reinforcement Steel – (Primary Producers)
	ACC		RINL
	Ultratech		SAIL
	Vikram		TATA STEEL Ltd.
	Shree Cement		
	Birla Jute		
	J. P. Rewa		
	CCI		
	Madras Cement		
	India Cement		
	Chettinad		
3.	GI PIPES	4.	GI PIPE FITTINGS
	a. Jindal		a. R-Brand
	b. Zenith		b. K.S.Brand
	c. Apollo		c. Zoloto
	d. GST		d. RR
	e. Prakash		e. SSS
	f. QST		f. NMC
5.	COPPER PIPES / TUBES	6.	MULTI LAYER COMPOSITE PIPES
	a. Rajco Metal Industries		a. Ki TEC
	b. B.P.Conex		b. Kisan
	c. Comap		c. Flowguard CPVC Astral
7.	PVC PIPES AND FITTINGS	8.	UPVC (UNPLASTICIZED PIPES & FITTINGS)
	a. Chemplast		a. Prince
	b. Prince		b. Supreme
	c. Supreme		c. Paras
	d. Finolex		
	e. Oriplast		

Sl. No	MAKES / AGENCIES / BRANDS	Sl. No.	MAKES / AGENCIES / BRANDS
9.	GATE VALVES, GLOBE VALVES	10.	FOOT VALVES , CHECK VALVES
	a. Leader		a. Kirloskar
	b. Kirloskar		b. Leader
	c. Zoloto		c. Ashoka
	d. Orient		
11.	WATER METERS	12	FERRULES
	a. Capstan		a. Leader
	b. Anandaasahi		b. Hindco
	c. Dasmesh		c. Neta
	d. Remco		d. Annapurna
13	BIB COCKS, STOP COCKS, PILLAR TAPS ETC.	14	LOW LEVEL FLUSHING CISTERNS (PVC / CERAMIC)
	a. Jaguar (Continental Series)		a. Parryware
	b. Marc (Oriental Series)		b. Cera
	c. Essco		c. Hindware
	d. ARK		d. Commander
	e. GEM		
15.	VITREOUS SANITARY WARE LIKE IWC, WASH BASIN, URINALS, EWC ETC.	16.	PLASTIC SEAT AND COVER
	a. Parryware		a. Commander
	b. Cera		b. Parryware
	c. Hindware		c. Bestolite
	d. Neycer		d. Duroshine
17.	BATHROOM FITTINGS	18.	CI PIPES & FITTINGS
	a. Jaguar (Continental Series)		a. Hind
	b. ESSCO		b. BIS
	c. Gem		c. BIC
	d. ARK		d. NECO
	e. Marc (Oriental Series)		
19.	CI NAHANI TRAP	20.	SW PIPE
	a. BIC		a. HIND
	b. SKF		b. PERFECT
	c. NECO		c. BURNS
	d. RAJCO		

Sl. No	MAKES / AGENCIES / BRANDS	Sl. No.	MAKES / AGENCIES / BRANDS
21. PVC CABINET MIRROR		22. SLUICE VALVE	
a. Commander		a. Leader	
		b. Kirloskar	
23. HDPE / LDPE / LLDPE WATER STORAGE TANKS		24. CERAMIC / GLAZED TILES	
a. Sintex		a. Nitco	
b. Polycon		b. Kajaria	
c. G&P		c. Euro	
		d. H. R. Johnson	
		e. SOMANY	
25. VITRIFIED TILES		26. PLY WOOD(BWR) BLOCK BOARD	
a. Nitco		a. Kitply	
b. Kajaria		b. Archid	
c. RAK		c. Green Ply	
d. EURO		d. Century Ply	
e. SOMANY		e. Bhutan Board	
		f. Sharon	
		g. Anchor	
		h. Swastik	
		i. National	
27. FLOAT GLASS		28. PVC DOORS & DOOR FRAMES	
a. Saint Gobain		a. Rajshri	
b. Modi Guard		b. Sintex	
c. Triveni Sheet Glass		c. Supreme	
d. Indo Asahi Glass Co.			
e. Tata			
f. Atul			
29. ALUMINIUM EXTRUDED SECTIONS		30. STAINLESS STEEL KITCHEN SINKS	
a. Hindal		a. Nirali	
b. Jindal		b. Farnkee	
c. Indal		c. Jayna	
d. Hindalco		d. Diamond	
		e. Neelkanth	

31. PRE - LAMINATED / VENEERED PARTICLE BOARD	32. FLUSH DOOR SHUTTERS
a. Novopan	a. Kuttly Flush Doors
b. Green Lam	b. Century
c. Kitlam	c. Green Ply
d. Archid Lam	d. Shiva Hari Ply wood Ltd. (Corbett)
e. Swastik	e. Anchor Ply
	f. Swastik Ply
	g. Western India
	h. Parvathi Wood
33. DECORATIVE LAMINATES	34. FLOOR SPRINGS
a. Green Lam	a. Everite
b. Merino	b. Hardwyn
c. Sunmica / Formica	c. Efficient Gadgets
d. Century	d. Garness
e. Durian	e. Dormer
f. Sundek	
g. Anchor	
h. Decolam	
35. VENEERS	36. MDF BOARDS
a. Decowood	a. Duratuff
b. Euro Veneers	b. Nuwud
c. Durian	c. Century
d. Green Lam	d. Novopan
	e. Kitply
	f. Green Ply
37. ADHESIVES	38. WOOD PRESERVATIVES
a. Fevicol-SH	a. Bison
b. Araldite	b. Godrej
c. Ciba Giegy	c. Kot
d. Mowool -HV of Mafatlal	
39. HARDWARE FITTINGS	40. DOOR CLOSERS
a. Jyoti	a. Everite
b. Argent	b. Hardwyn
c. C.I.E.F.	c. Efficient Gadgets
d. Classic	d. Ebco
e. Everite	e. Dorma
f. Metaco India	f. Garness
g. JH Alumium	
h. PV Radhakrishna	
i. Etalia	
j. Hardwin	

Sl. No	MAKES / AGENCIES / BRANDS	Sl. No.	MAKES / AGENCIES / BRANDS
41.	DRAWER SLIDERS	42.	LOCKS
	a. Efficient Gadgets		a. Godrej
	b. EBCO		b. Golden
	c. Etahoa		c. Efficient Gadgets
	d. Sisco		d. Mark
			e. Sheet
			f. Vision
			g. Dorma
43.	MIRRORS	44.	WATER PROOFING COMPOUND
	a. Atul		a. Impermo
	b. Sun		b. Cico
	c. Commander		c. Pidilite
	d. Saint Gobain		d. Roff
	e. Globe		e. Choksey
	f. Modi Guard		f. Hindustan Ciba Gaigey
			g. Accoproof
			h. Sika
			i. Fosroc
45.	STEEL WINDOWS AND VENTILATORS	46.	AC PIPES / SHEETS
	a. Agew Steel Mfg Co. Ltd.		a. Charminar
	b. Sen Harvic		b. Everest
	c. Hopes		c. Visakha
	d. Diana Casements		d. Orient
	e. Madhu Industries Bangalore		e. Ramson
	f. Mulltiwin Unique Metal Windows		
	g. Ankur Industries		
	h. Modern Fabricators		
47.	SPECIAL PROTECTIVE & DECORATIVE FINISH	48.	OIL BOUND DISTEMPER
	a. Snowcem Paints		a. Asian
	b. Asian Paints		b. Berger
	c. Berger		c. Jenson & Nicholson
	d. Jenson & Nicholson		d. ICI
	e. Kansai- Nerolac		e. Kansai-Nerolac
	f. ICI		f. Godawari
	g. Godawari		

Sl. No	MAKES / AGENCIES / BRANDS	Sl. No.	MAKES / AGENCIES / BRANDS
49. CEMENT PAINT		50. SURFACE TEXTURE	
	a. Snowcem Plus		a. Heritage (Bakelite Hylam Ltd.)
	b. Berger		b. Spectrum
	c. Asian		
	d. Jenson & Nicholson		
	e. Kansai – Nerolac		
	f. ICI		
	g. Godawari		
51. TEXTURED PAINT		52. ENAMEL PAINT / PRIMERS / READY MIXED PUTTY FOR WOOD WORK, IRON & STEEL	
	a. Snowcem India Ltd.-Sandtex matt		a. Asian
	b. Asian		b. Berger
	c. Jenson & Nicholson		c. Jenson & Nicholson
	d. Berger		d. Kansai – Nerolac
	e. Kansai – Nerolac		e. ICI
			f. MRF
			g. Godawari
53. WALL PUTTY		54. EXTERIOR EMULSION	
	a. Birla wall care		a. Asian Paints-Apex
	b. Snowcem paints		b. Berger Paints
	c. JK		c. Kansai – Nerolac
	d. Asian Paints		d. MRF
			e. Jenson & Nicholson
			f. ICI
			g. Godawari
55. CEMENT CONCRETE PIPES		56. EXPANSION JOINT BOARD	
	a. The Indian Hume Pipe		a. Shalimar Tar Products
	b. Premiere Pre-stressed Co.		b. Lloyds insulations
			c. Fosroc
			d. Shalitex
57. FALSE CEILING		58. VERTICAL BLINDS	
	a. Indian Gypsum		a. Vista Levlor
	b. Armstrong		b. Trac
	c. Daikin		c. Mac
	d. QED Panels		d. MARVEL
	e. Insula		

SI. No	MAKES / AGENCIES / BRANDS	SI. No.	MAKES / AGENCIES / BRANDS
59.	ADHESIVE FOR TILE FIXING	60.	PAVING TILES
	a. Roffe		a. Eurocon
	b. Bal Endura		b. Ultra
	c. Cera Bond		c. Duracrete
	d. Fosroc		
	e. Choksey Chemicals		
	f. Dr.Fixit		
	g. Sika		
	h. Sunanda		
61.	PVC FLOORING	62.	VINYL FLEXIBLE FLOORING
	a. Flora		a. Wonder Floor
	b. Armstrong		b. Armstrong
			c. BHOR
			d. Rikvin
			e. Tusker
63.	FIBRE GLASS DOORS	64.	SS / CP FRICTION HINGES
	a. Master craft		a. Ebco
			b. Jyoti
			c. Everest
			d. Magnum
65.	SOFT BOARD	66.	SCREW
	a. Jolly Board		a. Nettlefold
			b. GKW
67.	FIBRE REINFORCED COMP.DOOR		
	a. Loknath Unique		

APPROVED MAKE OF MATERIALS LIST FOR ELECTRICAL WORKS.

SL. NO.	MAKES/AGENCIES/BRANDS	SL. NO.	MAKES/AGENCIES/BRANDS
1.	COPPER CONDUCTOR PVC INSULATED FR, 1.1 KV GRADE WIRE/CABLE.	2.	PVC/XLPE INSULATED ALUMINUM/ COPPER CONDUCTOR CABLE (HT/ LT). ARMoured
	1) FINOLEX 2) HAVELLS 3) RR CABLES 4) V GAURD		1) FINOLEX 2) FORT GLOSTER 3) CCI 4) RR KABLE 5) DELTON
3.	MAIN SWITCH WITH HRC FUSES.	4.	MAIN SWITCH WITH REWIREABLE FUSES.
	1) L&T 2) SIEMENS 3) GE 4) ENGLISH ELECTRIC 5) HAVELLS 6) STANDARD		1) L&T 2) CROMPTON GREAVES 3) HAVELLS 4) STANDARD
5.	MCCB	6.	MCB/ELCB/ELMCB/DB
	1) LEGRAND 2) SCHNIDER ELECTRIC 3) L&T 4) SIEMENS		1) LEGRAND 2) SCHNIDER ELECTRIC 3) HAGGER 4) SIEMENS
7.	CHANGE OVER SWITCH/ SWITCH FUSE UNIT UP TO 100 AMP.	8.	CHANGE OVER SWITCH/ SWITCH FUSE UNIT ABOVE 100 AMP.
	1) L&T 2) HAVELLS 3) SIEMENS 4) HPL 5) STANDARD		1) L&T 2) SIEMENS 3) HPL

SL. NO.	MAKES/AGENCIES/BRANDS	SL. NO.	MAKES/AGENCIES/BRANDS
9.	RISING MAINS	10.	PVC CONDUIT & ACCESSORIES. (ISI MARKED)
	1) ENGLISH ELECTRIC 1) GEC 2) SCHNIDER ELECTRIC		1) PRECEISION 2) AVON PLAST 3) ESSARKE 4) SUDHAKAR 5) KALINGA 6) AKG
11.	PVC CASSING CAPPING (ISI MARKED)	12.	M.S. CONDUIT & ACCESSORIES.
	1) PRECEISION 2) SUDHAKAR 3) KALINGA 4) AKG 5) DIAMOND		1) SUPREME 2) BIC 3) NIC 4) AKG
13.	FLOOR TRUNKING SYSTEM	14.	G.I. PIPE
	1) LEGRAND 2) MK ELECTRIC 3) PRECEISION 4) MODI		1) TATA 2) JINDAL 3) SENITH 4) PRAKASH 5) GST 6) APOLLO
15.	MODULAR SWITCHES, ACCESSORIES & ELECTRONIC REGULATOR	16.	NON MODULAR SWITCHES ,ACCESSORIES & ELECTRONIC REGULATOR
	1) ANCHOR ROMA 2) SSK 3) LEADER 4) CRABTREE 5) MK		1) ANCHOR 2) LEADER 3) SSK 4) CPL
17.	INDUSTRIAL PLUG & SOCKETS.	18.	CEILING/ EXHAUST/ WALL FAN
	1) LEGRAND 2) HAGER 3) HAVELLS 4) CROMPTON GREAVES 5) STANDARD		1) USHA 2) BAJAJ 3) CROMPTON GREAVES 4) ORIENT 5) ALMONARD

SL. NO.	MAKES/AGENCIES/BRANDS	SL. NO.	MAKES/AGENCIES/BRANDS
19.	INDOOR LIGHT FITTINGS	20.	OUTDOOR LIGHT FITTINGS
	1) PHILLIPS 2) WIPRO 3) CROMPTON GREAVES 4) GE		1) PHILLIPS 2) WIPRO 3) CROMPTON GREAVES 4) GE 5) K-LITE
21.	CABLE GLANDS	22.	CABLE LUGS
	1) COMET 2) DOWELLS 3) BRACO 4) SIEMENS		1) DOWELLS 2) COMET
23.	CONNECTORS	24.	FLUORESCENT LAMPS
	1) ELMEX 2) CONNECT WELL 3) PHONEIX		1) PHILLIPS 2) OSRAM 3) CROMPTON GREAVES 4) BAJAJ 5) GEC
25.	COMPACT FLUORESCENT LAMPS	26.	MOTOR STARTERS
	1) PHILLIPS 2) OSRAM 3) HAVELLS 4) WIPRO		1) SIEMENS 2) L&T 3) CROMPTON GREAVES
27.	MONOBLOCK PUMPS	28.	LIGHTENING ARRESTORS
	1) KIRLOSKAR 2) CROMPTON GREAVES 3) CRI		1) PACTIL 2) HECO 3) ATLAS 4) G.K.ELECTRICALS
29.	TRANSFORMER UP TO 500 KVA	30.	TRANSFORMERS ABOVE 500 KVA
	1) PACTIL 2) EMCO 3) CROMPTON GREAVES 4) KIRLOSKAR 5) GEC 6) TESLA		1) KIRLOSKAR 2) GEC

SL. NO.	MAKES/AGENCIES/BRANDS	SL. NO.	MAKES/AGENCIES/BRANDS
31.	A.B. SWITCH & DO FUSE	32.	SELECTOR SWITCH
	1) PACTIL 2) JENCO 3) CROMPTON GREAVES 4) ATLAS		1) KAYCEE 2) SIEMENS 3) C&S
33.	INDICATING LAMPS	34.	CONTACTORS
	1) VAISHNO 2) ESSEN 3) PHILLIPS		1) SIEMENS 2) L&T 3) ABB 4) SCHNIDER ELECTRIC
35.	MEASURING INSTRUMENTS	36.	PF IMPROVEMENT CAPACITOR & APFC PANEL
	1) AMP 2) MECO 3) AE 4) ENERCON 5) PROK-DV's		1) EPCOS 2) NEPTUNE 3) L&T 4) CROMPTON GREAVES
37.	RELAY FOR AUTOMATIC PF IMPROVEMENT	38.	CURRENT TRANSFORMER
	1) EPCOS 2) CONZERVE 3) L&T		1) AE 2) RISHAB 3) KUPPA 4) L&T
39.	DATA CABLES & FACTORY MADE PATCH CORDS	40.	INFORMATION OUTLET/ RJ-45 CONECTORS/RJ-11 SOCKETS
	1) LEGRAND 2) D-LINK 3) FINOLEX 4) MOLEX 5) AMP		1) D-LINK 2) LEGRAND 3) MOLEX 4) SYSTEMAX 5) AMP
41.	TELEPHONE WIRES	42.	RG 6 CABLE FOR TV
	1) FINOLEX 2) DELTON 3) HAVELLS 4) RR KABLE		1) FINOLEX 2) DELTON 3) NATIONAL

SL. NO.	MAKES/AGENCIES/BRANDS	SL. NO.	MAKES/AGENCIES/BRANDS
43.	JACK PANEL	44.	RACK
	1) D-LINK 2) LEGRAND 3) MOLEX 4) SYSTEMAX 5) VALRACK 6) AMP		1) VALRACK 2) DIGITRON 3) HCL 4) A LINK
45.	FIRE ALARM PANEL	46.	SMOKE & HEAT DETECTORS
	1) HONEYWELL 2) CARMEL 3) ZICOM 4) NOTIFIER 5) MIRCOM/SECUTRON 6) MORLEY IAS		1) APPOLO 2) MORLEY IAS 3) EDWARD 4) SYSTEM SENSOR 5) HONEYWELL 6) MIRCOM/SECUTRON
47.	MANUAL CALL POINTS/ HOOTER/ INDICATOR		
	1) HONEYWELL 2) ZICOM 3) NOTIFIER 4) SIMPLEX 5) CARMEL 6) MIRCOM/ SECUTRON		

ADDITIONAL SPECIAL CONDITIONS :

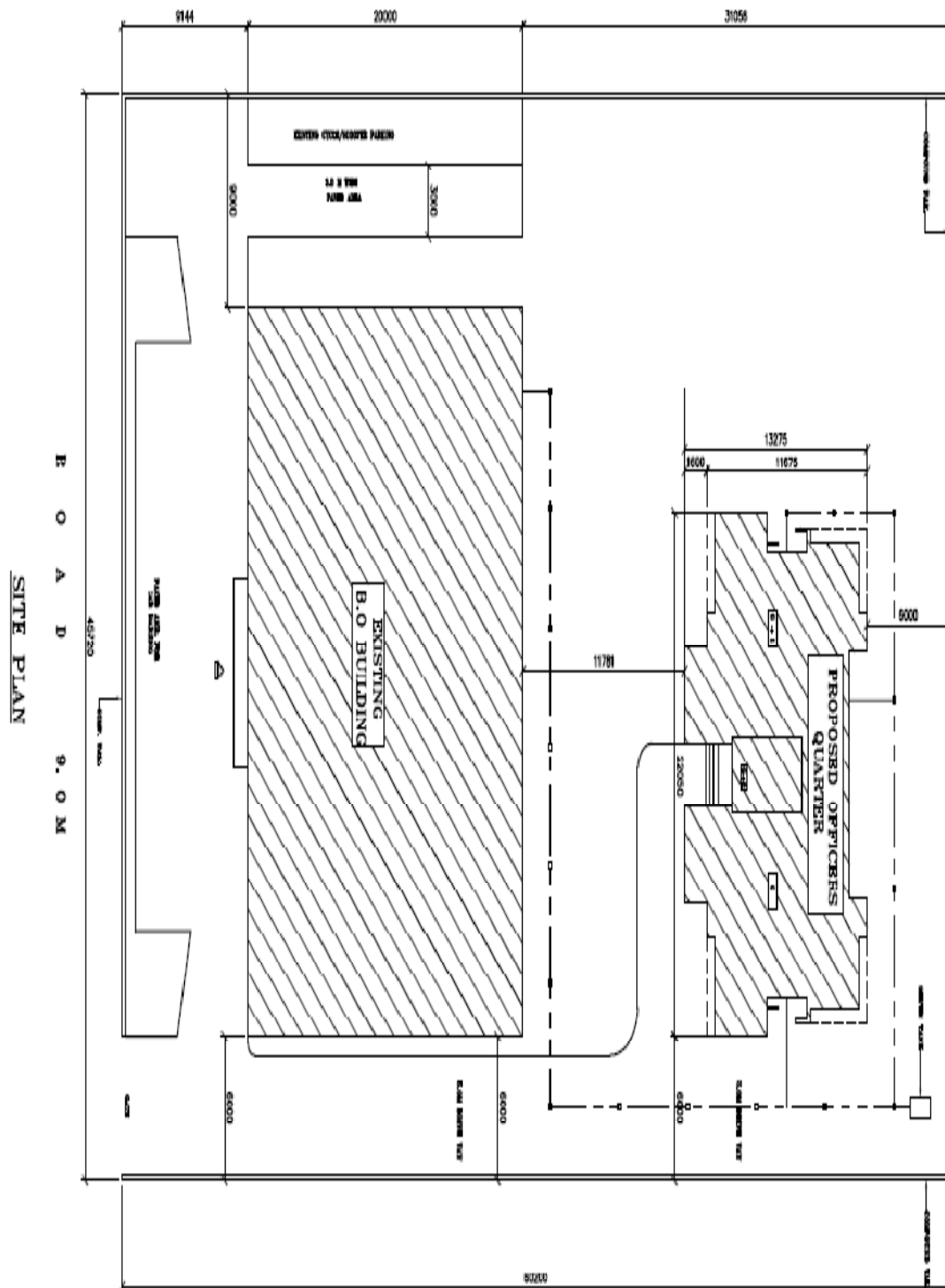
1. Life Insurance Corporation of India shall not be responsible for any act of nature or otherwise like Riots, Terrorist Activities, Curfew, Bunds by any Political Party or Activists, Stopping the work by any local or Government Authorities.
2. No Claim or Compensation on this account, from the Contractor, shall be entertained or paid. The rates quoted by the contractor shall include for all such similar activities. However, reasonable / justified Extension of Time shall be considered, as per contract conditions.
3. **Completion Certificate for the Building:** The contractor after completion of the work shall be responsible for obtaining the completion certificate from the appropriate authorities if required, and will make all necessary arrangements to procure the same. The contractor shall file applications and follow up with appropriate authorities and shall give all notices, required by the Acts, regulations or certificates and drawings as required and will make necessary arrangements to procure the completion certificate if required, without any extra charges. All incidental charges/ expenses associated with the above work shall be borne by the contractor. All inspection fees or submission fees paid by the contractor will be reimbursed by the owner against valid official receipts.
4. **Water and Sewerage Connection :** The contractor after completion of the work shall be responsible for obtaining the Water and Sewerage Connection from the appropriate authorities as required and will make all necessary arrangements to procure the same if the same is available there. The contractor shall file applications and follow up with appropriate authorities and shall give all notices, required by the Acts, regulations or certificates and drawings as required and will make necessary arrangements to obtain the Water and Sewerage connection if required, without any extra charges. All incidental charges/ expenses associated with the above work shall be borne by the contractor. All inspection fees or submission fees paid by the contractor will be reimbursed by the owner against valid official receipts.
5. The quoted rate should be inclusive of applying and liaison with Electricity Supply Authority for a domestic load of 5KW, single phase, 230 V for each flat.

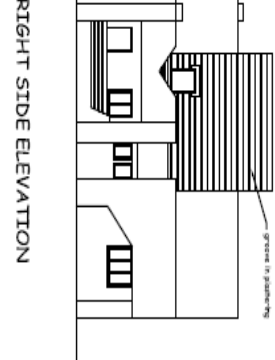
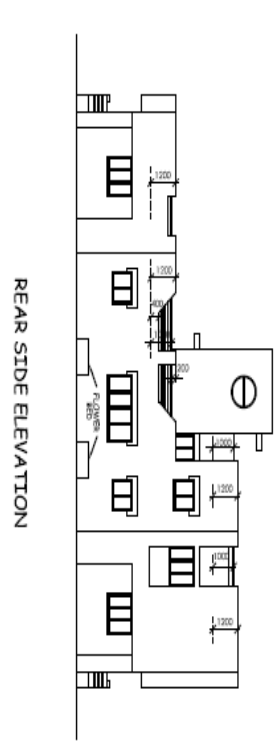
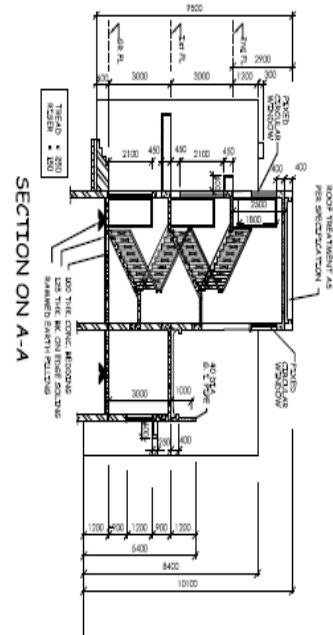
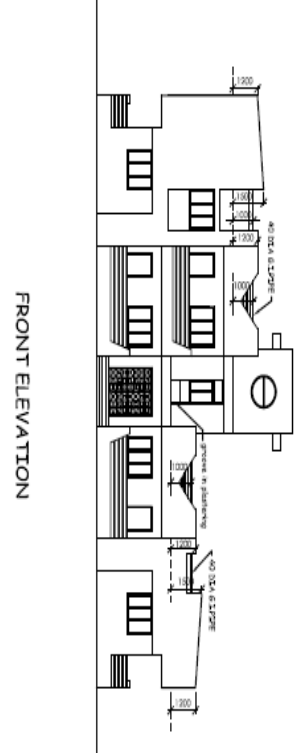
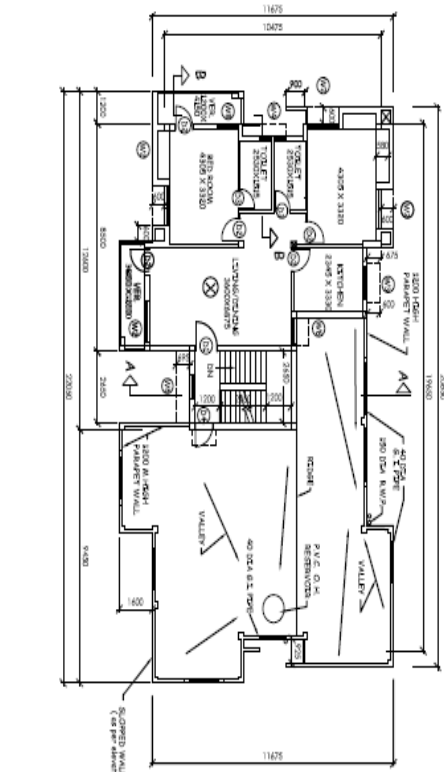
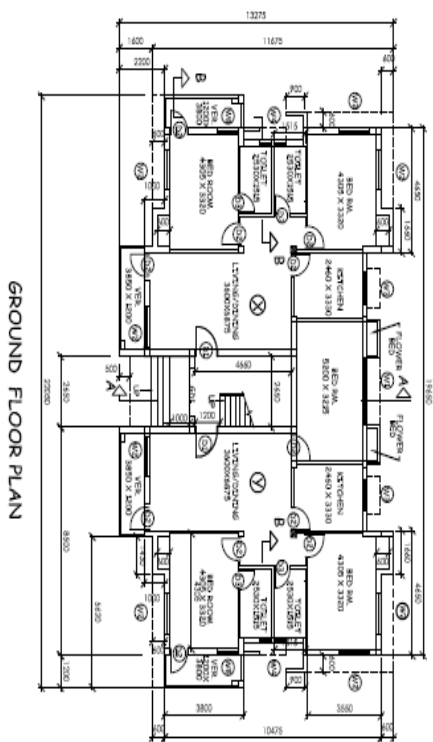
LIST OF DRAWINGS

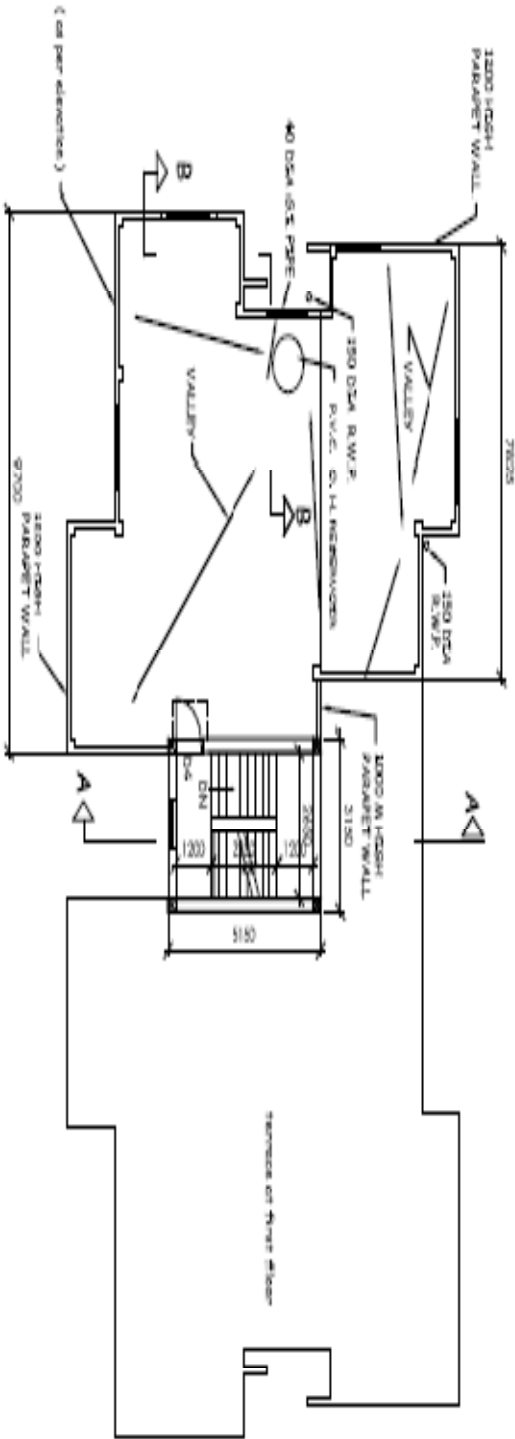
The following list of drawings is enclosed

ARCHITECTURAL DRAWINGS:-

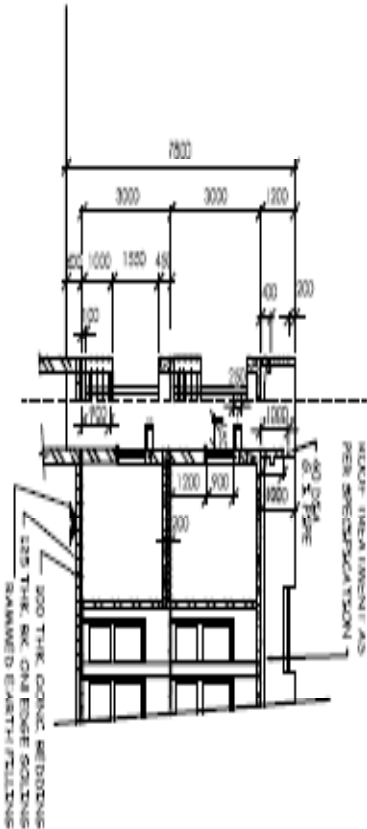
S. NO.	DESCRIPTION
1	SITE PLAN
2	GROUND FLOOR, FIRST FLOOR PLAN, FRONT RIGHT AND REAR SIDE ELEVATION,
3	TERRACE FLOOR PLAN, SECTION AT B-B
4	LEFT SIDE ELEVATION,



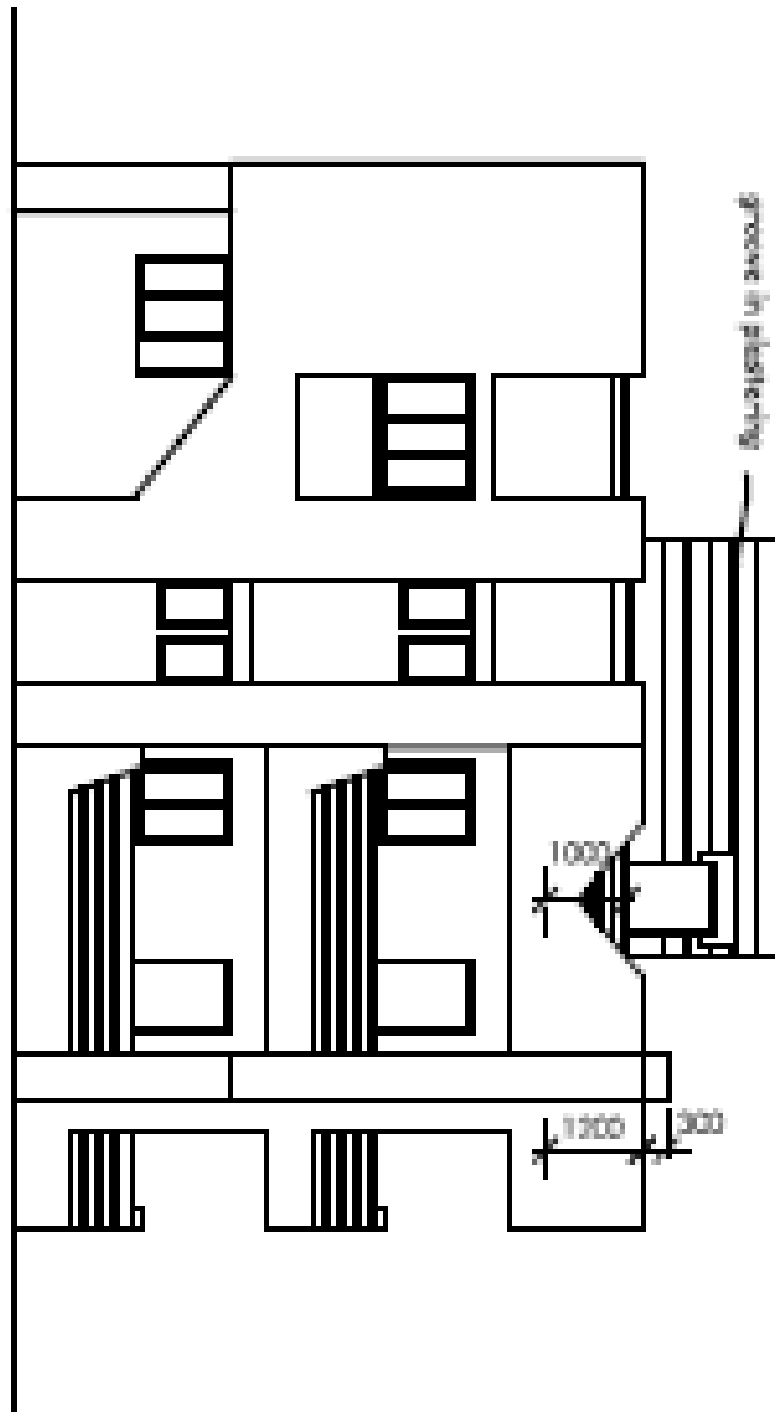




SECTION ON B-B



LEFT SIDE ELEVATION



LIFE INSURANCE CORPORATION OF INDIA

TRADE PREAMBLES TO SCHEDULE OF QUANTITIES

These Preambles will apply to respective trades of the Schedule.

1. EXCAVATION AND EARTH WORK

1. Contractor's rate shall cover for clearing the site of shrubs, brush wood, underground & small trees not exceeding 30 cm. in girth measured at 1 mtr. above ground so that laying out, collection of materials & excavation can commence without hindrance. The block levels shall be taken only after clearing site as above.
2. Measurement for payment excavation unless otherwise mentioned shall be as per drawing, dimensions of bed concrete. Any additional excavation needed for working space, form work, planking, strutting wherever required etc. shall not be measured separately & rates quoted shall include for the same.
3. Rates for excavation shall include shoring, timbering, strutting etc. for protection of excavated sides, bailing out surface water due to rains or sub soil water if encountered & dewatering by any pumps wherever required until all work below water level is finished to the satisfaction of the Dy. Chief Engineer or his representatives.
4. Black cotton soil shall not be used for refilling, around foundations & or filling under floors, soil used for filling shall be dry, free from roots & vegetable mould & shall be approved by Dy. Chief Engineer or his representatives.
5. Refer I.S. 1200 (Part-I), 1974 for classification of excavated material. Executive Director's (Bldgs.) interpretation regarding classification shall be final & binding on Contractor.
6. Excavated rock/boulders if any could be used for soling if approved by Dy. Chief Engineer or his representatives. Recovery at the rate of Rs. 500/- per Cu.mt. shall be made based on stack measurement after deducting 50% for voids.
7. Before starting excavation or filling work in site, the requisite block level of the entire plot shall be taken by the Contractor jointly along with LIC Engineers.
8. Filling in plinth with approved excavated soil &/ or soil brought from outside shall be measured net in position after consolidation. Before the item of filling, in with soil brought from outside is operate, the contractor shall take prior permission of the Dy. Chief Engineer or his representatives & also arrange to take measurements of filled in soil in plinth with excavated stuff from the site.
9. Contractor is requested to satisfy himself to the character of soil & excavation & collect his own information on all matters affects excavation.
10. The excess earth/dismantled debris/refuse shall be removed & transported at contractor's cost & disposed off as directed.
11. Recovery of old Reinforcement, Steel work in built up sections or in single section made of Tees, angles, Flats, Channels, Joists, etc. removed from old structure shall be @ Rs. 4000/MT & for the old full bricks @ Rs. 500 per 1000 bricks.

2. CONCRETE & FORM WORK

1. P.C.C. shall mean plain cement concrete.
R.C.C. shall mean Reinforced cement Concrete.
2. **CODE OF PRACTICE:** All workmanship, materials, tests & performance in connection with Reinforced Concrete shall be in conformity with IS. Code of Practice for Reinforced Concrete in Building IS : 456 - 1964 with amendments if any, unless otherwise specified, in this contract. Where otherwise specified, by provisions made in this contract shall hold good.
3. **CONTROLLED AND ORDINARY CONCRETE :** 'Controlled Concrete' & 'Ordinary Concrete' wherever so defined shall be as per definition in Cl. No. 5.3.1 of IS : 456 - 1964. All relevant specifications under 'Concrete' in these preambles & in General specifications shall be applicable to controlled concrete/ ordinary concrete or exposed concrete where so classified.
4. **VOLUME BATCHING :** The proportion of mixes is by volume. Cement shall not, however, be measured by volume but shall be measured by weight one bag of cement containing 50 kg. of cement shall be assumed to containing 35 litres (1.20 cft). When weigh batch mixing is used, prior approval of the Executive Director (Bldgs.) shall be obtained to co-relate volume mix to weigh mix.
5. **FORM WORK :** Form work or shuttering shall be water tight & of timber / steel / plywood.
6. **AGGREGATES :**
 - i) Machine crushed grade stone aggregate from approved source shall be used as coarse aggregate & shall conform to ISI standard. Aggregate shall be washed clean, if necessary. Unless otherwise mentioned, the maximum size of coarse aggregate shall be 20mm graded down. Where thickness of the concrete member is 75mm & below, the maximum size of coarse aggregate shall be so selected that it does not exceed the $\frac{1}{4}$ of the mini thickness of the size of the structural member & graded down. Rates quoted shall allow for these factors.
 - ii) Fine aggregate shall be graded coarse sand from approved source & conforming to I.S.I standards & shall be washed clean, if necessary.
7. **ALLOW IN RATES :**
 - a) Rates quoted for all concrete items shall include for centering, form work, if specified in the schedule of quantities, machine mixing, pouring, consolidation by mechanical vibrators, curing, stripping form work, hacking of concrete where they have to receive plaster (but the plaster on concrete etc. surface shall be measured & paid for separately under respective plaster items etc. comp. unless otherwise stated.
 - b) Rates for all concrete items shall include for :
 - i) Sinking of floors in toilets, kitchen, leaving or forming holes for taking out dowel bars for fan hooks, provision for fixing plumbing pipes & accessories & electrical conduits (if any) gaps, slopes etc. in shuttering as directed.
 - ii) Allowing work for other agencies being carried out by them like laying conduits, boxes, pipes, clamps etc. as directed before laying concrete.
 - iii) For forming chambers, bands, drip moulds in columns, beams, slabs, chajjas, sills, facias, openings etc. & wherever directed.

- c) In case of reinforced concrete work, the rate for concrete items shall allow for pouring concrete around reinforcement shall be measured & paid for separately unless otherwise stated in the item.
- d) Rates quoted for all concrete items, like beams, ribs, columns, slabs etc. shall include for structural members of any shape & sections like linear, circular, curved, of any other type as required &/or as per detailed final drawings for cantilever, including providing slopes to slabs, beams, chajjas, canopies etc. wherever required.
8. No concrete shall be poured unless & until all fittings & fixtures for electrical & otherwise, are inserted, laid & approved/passed by Engineer-in-Charge.
9. **SIZES OF RCC MEMBERS:** The sectional dimensions of PCC. & RCC members are subject to change & no extra claim from contractor will be entertained on account of such changes, sectional sizes mentioned are structural sizes, exclusive of finishes like plaster, unless otherwise stated in the item itself.
10. **JUNCTIONS OF COLUMNS, BEAMS ETC:** In case where at the junctions of columns, beams & slabs the composition of concrete mix of specified strength be different for columns, beams & slabs there in such cases only the richest concrete among these specified for any of these member shall be used at the time junctions & rates quoted for columns, beams & slabs or any member entering such junctions shall allow for the same. Also allow for spill over richer concrete in beams etc. to rational angle of repose of wet concrete required from practical considerations while concreting the junctions. No separate payment shall be made on this account.
11. Rates quoted for concrete include the forming & treatment of construction/expansion joints as shown on drawings or required at site, except for supply of copper & G.I. strip & which shall be paid for separately.
12. **WATERPROOFING COMPOUND:** Cement waterproofing compound wherever mentioned in the item shall be of any approved make & mixed by weight of cement as per the manufacturer's specifications & rates quoted shall include for the same.
13. **PRECAST CONCRETE:** Rates for Concrete items shall be inclusive of moulds, finished faces, hoisting to all heights & levels & setting in position including jointing in cement mortar 1:3 & cement grouting as per detailed drawings. Reinforcement shall be paid for under 'STEEL AND IRON WORK' section, unless otherwise specified.
14. Please note that unless otherwise mentioned in the items/ schedule of quantities, all concrete specified in this tender shall be ordinary grade concrete as per "TABLE II - CONCRETE MIX PROPORTIONS" Clause no. 2.4 under-sub-head "2" concrete & steel reinforcement of specifications for Civil Work.

3. BRICK WORK

1. Size of bricks shall be 23x11.5x7.5 cm nominal & shall be from appd. source. Bricks shall be well burnt first quality, having regular shape with sharp corners & edges & should stand all tests as required by ISI specifications. One brick wall shall be considered as 23cm. thick. Half brick wall shall be 11.5cm thick & brick on edge wall shall be 7.5 cm. thick.
2. Crushing strength of the bricks to be used in the work shall not be less than 75 Kg. per square cm. unless otherwise stated in item of the schedule of quantities.
3. The rates quoted shall include for all work like those in walls, jambs, pillars, mullions, steps, kerbs/threshold, corbels, pins & raking out joints, cutting, scaffolding & curing etc. & also for providing opening/niches in masonry for drainage/rain water poles etc.
4. The rate quoted shall also include for recesses, cutouts, etc. in brick work for electrical work & nitch for rain water pipe to be encased at a later stage in the brick work, all as shown on drawings & as directed on site.
5. Sand for masonry mortars shall be as per IS : 2116 - 1965 as applied to un-reinforced brick work.
6. For exposed brick work, selected & approved bricks shall be used having uniform colour, size & sharp corners & edges.

4. STEEL FABRICATION WORK

1. Rates quoted for reinforcement shall include for the cost steel, all fabrication including cutting of length as shown in the drawings, all labour in binding & cranking forming, hooked ends, storage, handling, hoisting etc. right up to placing of steel in position up to the final stage of work according to the drawings, providing necessary binding wire, temporary supporters & for rolling margin in calculated weight. All wastage shall be to the Contractor's account.
2. The rate quoted for reinforcement shall include for the cost of annealed steel binding wire of size not less than 0.90 mm & conforming to IS : 280 - 1962. The weight of the binding wire shall not be accounted for in the measurements. The rate shall also included for precast concrete cover blocks of specified sizes as directed.
3. The rate shall hold good for reinforcement in any structural member irrespective of its location & dimensions.
4. Reinforcement shall be placed as shown on the structural drawings & payment will be made on net measurement from drawings. Only such laps, dowels chairs & pins in reinforcement as approved by the Suptd. Engineer / Executive Engineer & shown on drawings shall be paid for. The Contractor shall allow in his rates for any wastage which will not be paid for. Rates shall allow for removal or rust by rubbing with wire brush as directed.
5. Welding or reinforcement bars will not be permitted unless specially authorized by the Executive Director (Bldgs.).

6. For steel or Tistrong – It shall be used as per recommendation of the manufacturers & rates shall allow for this.
7. Rate for M.S. railing, grills, rolling shutters, M.S. angles & tees in door frames, grills, door, ladder, run ladder, fan hooks, weld mesh grills etc. shall include for the following.
 - a) Fabrication, cutting & bending to required size, patterns & shape, drilling, punching, counter sinking, welding, filling etc. finishing, erecting, fixing in position.
 - b) Wherever the M.S. grills/railing/ rolling shutters M.S. weld mesh, grills are required to be fixed to stone/brick concrete jambs/floor, they shall be fixed by means of required number of M.S. lugs of 100 x 16 x 3mm &/or suitable size embedded/grouted in cement concrete block 1:2:4 &/or by means of suitable countersunk screws with rawl plugs.
 - c) Wherever the M.S. grills are required to be fixed to frames of steel windows & ventilators, they shall be fixed by welding.
 - d) Grill door shall be fixed by means of M.S. holdfast or required number, size & shape as approved, embedding/grouting the holdfast in 1:2:4 cement concrete block &/or rag bolts & nuts of approved size.
 - e) Both legs of both ends of M.S. ladders shall be fixed to concrete floors/slab by embedding/grouting in 1:2:4 cement concrete block base of required size.
 - f) M.S. rung - ladders shall be fixed in stone/brick/concrete work by embedding/grouting in 1:2:4 cement concrete.
 - g) In case of M.S. grills doors the Contractor shall provide & fix stone/brick concrete jambs to accommodate the sliding rod of alldrops.
 - h) Rate quoted for M.S. guard bars/M.S. grills to windows & ventilators/fanlights shall also include for making holes in frames of windows & ventilators/fan lights wherever required.
 - i) The fixing accessories like M.S. holdfast, lugs, screws, rawl plugs, concrete for embedding/grouting, bolts & nuts of any type GI pipe pieces & such other accessories for fixing. All these shall not be considered in the measurement of the weight/quality & shall not be paid separately.
 - j) Except for bar reinforcement, all exposed steel, cast iron, wrought iron & mild steel work, unless otherwise mentioned, shall be painted with three coats of synthetic enamel paint of first quality of approved brand, colour & shade, including & coat of primer as per specification of the approved manufacturer. Rates quoted shall include for the above although three coats of paint are specified. Contractor will have to do additional coats of paint if well finished surface is not obtained to the satisfaction of the Dy. Chief Engineer/Suptd. Engineer/Executive Engineer & there shall be no extra payment on account of this.
8. The rolling shutter shall be fixed over the opening by fixing the side-jamb guides against the walls (but not in between the jambs of the opening). For measurement of rolling shutter, the area of the actual opening covered shall only be considered.

9. **MEASUREMENT:** Weight of the steel reinforcement bars (Mild steel & high strength deformed bars) used in the construction shall be on the basis of the length incorporated in concrete & shall be computed in accordance with the table given below:-

diameter mm	weight per mtr. length (in Kg.)	diameter mm	weight per mtr. length (in kg.)
6	0.222	20	2.467
8	0.395	22	2.985
10	0.617	25	3.855
12	0.888	28	4.836
16	1.579	32	6.316

Note :

The weight per meter bars given in the table above are calculated on basis that steel weights 7.85 g. per cu.cm. In case of any error or omission in this table, the weight per meter length in kg. shall be computed on the basis of actual area & taking the density of steel as 7.85 gm per cu.cm.

5. **STEEL WINDOWS AND VENTILATORS & PRESSED STEEL FRAMES**

1. Specifications are applicable for the trades & as given elsewhere in the tender are applicable in except where otherwise mentioned in following paras or in the wording of items. The rates quoted shall cover for complying with the same.

2. i) Steel windows & ventilators shall be manufactured by any approved manufacturer as per list of approved makes/ brand.

Rates quoted for steel windows & ventilators shall include for cost of copper oxidized Mild Steel Hardware fittings & fixtures as shown on drawings. Rates quoted shall be for the make or group of makes as mentioned in respective items. Sections used shall be manufactured from approved good quality mild steel rolled sections conforming to IS : 7452 - 1974 & in accordance with IS : 1038 - 1975 (Revised).

ii) Sections for windows & ventilators shall be straightened on hydraulic stretching plant, cut to required lengths, & corners to be electrically flash butt welded, flushed to form one solid welded joint to conforming to requirements of welded joint under clause no. G.I. IS : 1038 - 1975 (revised). No other method of welding except electrical flash welding shall be permitted.

iii) Steel windows & ventilators shall be fixed to stone/brick work by means of standard M.S. lugs of size 100 x 16 x 32mm embedded in cement, & to concrete work by means of 125mm long counter sunk screws with rawl plugs. Rates quoted for windows & ventilators shall include for the same.

3. For glazing, approved aluminium beading shall be fixed by means of cadmium plated iron screws of adequate size & length. Approved quality special putty suitable for metal windows shall be used as per manufacturer's specifications. The hollow portion between the frames & the brick/ stone/ concrete surface & between the component part of the frame shall be filled up with mastic/cement & sand fillet as per manufacturer's recommendations or IS specifications.

4. Glass shall be as manufactured by any approved manufacturer as per list of approved makes/brand.
5. Each glass pane/louver shall be measured to the nearest 0.5 cm. both in width & height.
6. No import license shall be made available for obtaining any material available in India.
7.
 - a) Steel window/ventilators & doors shall not be manufactured till the manufacturer's shop drawings & samples have been approved by the Dy. Chief Engineer.
 - b) If particular section is not available, contractor should state what alternative section they shall use. The C.E. may ask for modifications/improvement in the shop drawings as required in keeping with good practice & I.S.S.
 - c) The Dy./ Chief Engineer's decision regarding shop drawings & different types of sections depending on the arrangement, area of the opening & height to be provided for windows/doors shall be final & binding on the contractor.

No extra payment shall be made to the contractor for providing all such section as directed. The rate for steel windows should provide for cadmium plated iron screws for fixing the beading.
8. Wherever M.S. grills are required to be fixed to frame of steel windows & ventilators, they shall be fixed by welding.
9. Rates of steel windows & ventilators shall include for M.S. weather bars of approved size & pattern to be provided the coupling members (wherever required) as per IS : 1038 - 1975 (revised) specifications.
10. Please note that all side hung shutters shall have projecting type hinges & all hinges shall be greased properly before fixing & projecting types hinges shall be protected with oil papers during construction.
11. The hardware, fittings & fixtures for the steel windows & ventilators shall be provided & fixed as per drawings & shall be in conformity with the stipulation in IS : 1038 - 1975 (Revised). Rates quoted shall include for the same.
12. Steel windows & ventilators shall be painted with 3 coats of synthetic enamel paint of first quality of approved brand, colour & shade including approved primer coat as per list of approved brand/makes. Although three coats of paint are specified, Contractor will have to do an additional coat of paint, if well finished surface is not obtained to the satisfaction of the Engineer in Charge & there shall be no extra payment on account of this.

5. SPECIFICATIONS FOR PRESSED STEEL DOOR/WINDOW FRAMES :

Material – Steel door frames shall be manufactured from commercial mild steel sheet of 1.25 or 1.6 mm thickness, conforming to IS : 4351 – 1976.

Steel door frames with or without fan light shall be made in the profiles described which may be manufactured to suit doors of either hand, opening inwards or outwards as directed by Project Engineer.

Construction – Each door frames shall consist of hinges jamb, lock jamb, head & if required, angle threshold. The whole shall be welded or rigidly fixed together by mechanical means. Where no angle threshold is required, temporary base tie shall be screwed to the feet of frames in order to forms rigid unit. Where so specified base ties shall be pressed mild steel 1.25mm thick adjustable to suit floor thickness of 35 or 40mm & removable, or alternatively, threshold of mild steel angle of section 5/25 mm, minimum shall be provided for external frames. **Fabrication** – Fixing lugs there shall be three adjustable lugs with split & tail to each jamb without fan light, & four for jamb with fan light. The head of the fixing lug shall be of one of the following lengths :-

- a) 95mm long for use with Profile A.
- b) 120mm long for use with Profile B.
- c) 160mm long for use with Profile C.
- d) or other approved size & profile as per requirement.

The head shall be made from flat steel strip 25mm wide & not less than 1.60mm thick.

The tail of the lugs shall be 200mm long & shall be made to steel strip not less than 40mm wide & not less than 3mm thick.

Hinges 100mm mild steel butt thickness shall be used. For frames for door shutters width less than 90cm, three hinges shall be welded to one jamb for single shutter. For frames for door shutters width more than 90 cm., four hinges shall be welded to one jamb for single shutter. Three hinges on each jamb of frames shall be welded for double shutters.

In all cases the hinges shall be fixed that the distance from inside of the head rebate to the top of the upper hinges & the bottom of the lower to floor is about 175mm. Hinges shall be made of steel 2.5mm thick with a zinc-coated removable pin of 6mm diameter. The space between the two leaves of the hinge when closed shall be 3mm & the leaf that is not welded to the frame shall have for counter sunk holes to take no.10 wood screws.

Mortar Guards – Mortar guards as instructed by Project Engineer shall be provided. These shall be welded to the frame at the head of the frame for double shutter doors to make provision for bolts.

Lock-Strike plate – There shall be an adjustable lock-strike plate of steel, complete with mortar guard, to make provision for locks or latches complying with the relevant Indian Standards. Lock-strike plates shall be of galvanized mild steel & fixed at 95 cm from the head of the frame.

Shock-Absorbers – For side hung door shutters there shall be less than three buffers of rubber suitable material inserted in the holes in the rebate & one shall be located on the centre line of the lock-strike plate & the other two at least 45cm above & below the center line of the lock-strike plate. For double shutter doors there shall be two buffers of rubber or similar suitable material inserted in holes in the rebate in the lock jamb only at the head & spaces 15cm. at either side of the centre line of the door.

Finish – The door frames shall be either hot-dip galvanized or painted or as specified. The surface shall be thoroughly cleaned, free of dust, mill-scale dirt, oil etc. Either by mechanical means, for example, sand or shot blasting or by chemical means such as pickling & then painted or galvanized as directed by Project Engineer. After pretreatment of the surface one coat, of steel primer (zinc chromate) & two coats of enamel paint as directed by Project Engineer shall be applied to the exposed surfaces.

Measurements – The length shall be measured in running meter correct to a cm. out to out of the frames.

Rate – The rate shall include the cost of labour & material involved in all the operation described above including one coat of approved steel primer (zinc chromate) & two coats of enamel paint etc. complete as directed.

6. WOOD WORK AND ALUMINIUM WORK

1. T.W. shall mean Indian Teak wood of well seasoned, good quality, uniform colour, reasonably straight, grains free from cracks & shakes, wood shall be generally free from sapwood but traces of sapwood may be permitted. Maximum moisture contents shall not exceed 10 percent with tolerance limit for average moisture content of all the samples in a given lot + 2 percent & moisture content of individual sample +3 percent of maximum permissible moisture content.
2. Generally wood shall be free from knots. However, wood with knots may be permitted provided individual hard & sound knot shall not be more than 40mm in dia. & aggregate area of all the knots shall not exceed one & a half percent of the area of the piece. Teak wood shall be got approved before incorporating in the work. Contractor should ensure that wood work does not warp or show other defects due to lack of proper seasoning.
3. Timber shall be wrought, framed & cut to shape as shown on drawings &/or as required.
4. **FLUSH DOOR SHUTTER** shall be of approved make as per list of approved makes/brand and shall be solid core block board commercial/Teak veneered/faced & provided with seasoned hardwood lipping which shall be included in rates quoted.

Plywood shall be of approved make as per list of approved makes/brand & shall be water proofing quality phenol bonded (shuttering type) unless otherwise specified.

5.
 - a) Practical Boards shall be of approved make as per list of approved makes/brand of water proof quality, Phenol bonded, 3 layer flat pressed of approved brand.
 - b) Medium Density Fibre Boards shall be of approved make as per list of approved makes/brand of water proof quality, Phenol bonded/Urea Formeldihyde as per item.

6. PERMISSIBLE TOLERANCES – (DOOR WINDOW FRAMES)

- a) Frames – A tolerance of $\pm 2/3$ mm shall be allowed in the finished cross sectional dimension of door, window & ventilators frames.
- b) Shutter for door, windows & ventilators – The finished work with a tolerance of $(\pm -)$ 3mm. tolerance on thickness shall be $(\pm -)$.2mm, thickness of shutter shall be uniform through with a permissible variation not more than 0.8mm when measured at any two points.
7. Wherever painting is specified, wood work & joinery shall be painted with 3 coats of approved brand colour & shade, synthetic enamel paint of first quality, including approved primer as per list of approved makes/brand. Although 3 coats of paints are specified. Contractor will have to do an additional coat of paint, if well finished surface is not obtained to the satisfaction of the Engineer-In-Charge & there shall be not extra payment on account of this.
8. Wherever polishing is mentioned for wood work, it shall be wax/French polishing of approved finish as required. Where door, frames are fixed flush with plaster to walls, teak wood cover moulds/architrave shall be provided all round. T.W. cover mould shall be paid separately & shall be painted or polished as in doors/windows.
9. Unless otherwise specified rates quoted for shutters of doors/ windows/ fan light shall include for ordinary quality sheet glass plain or frosted, figured, wired glass or any other glass (as required) manufactured by m/s. Hindustan Pilkington or other equal & approved fixed with T.W. beading & approved putty.
10. Rates quoted for shutter of doors shall include for T.W. beading/T.W. planted beads for fixing panels of shutters of doors, wherever required to be provided. Rate also, shall include for painting/polishing of beading.
11. Rates quoted shall included for :-
Polishing all wood work with French or wax polish of approved quality and shade including the under surface as per the specifications to get a uniform finish or painting with two or more coats of first quality synthetic enamel paint of approved brand and shade over a coat of approved primer, including preparation of the under surface to get a uniform finish. Timbers faces coming in contact with masonry or concrete shall be painted with three coats of wood preservative and anti-insecticide paint before fixing in position. If proper evidence about seasoning and soundness of timber is provided the Engineer at site at his discretion may allow fabrication of sub frames and frames and paneled shutters.
12. Rates quoted for wood work & joinery shall include for rebates joints, chambers, mouldings, grooves, beads, laps, rounded angles, niches, nails, screws, pins etc.
13. Rates quoted for the item of the T.W. moulded hand rail (if required) for staircase/parapet wall (as the case may be) shall include the provision for special shape curve required the turning of the railing in conformity with the alignment of the railing. This shall be made out of one single piece of approved teakwood. No extra payment on this account shall be made to the Contractor.
14. Shutters of doors/ windows/ventilators/fan lights shall be measured net in a close position covering rebates of the frame. Overlap of two shutter shall not be measured.

15. For curved windows/ fan lights (if any) the area shall be measured from inside to inside of frame. Rate shall include for the T.W. beading required for fixing louvers as shown in the drawings (including painting/polishing to beading).
16. Rates quoted for doors windows/ fan lights shall include for :-
- Supplying & fixing M.S. holdfast of size 300 x 35 x 6mm as approved & shall be provided viz. 6 nos. fan light.
 - One end of holdfast to be fixed with posts of frames by 12 mm dia bolt & nuts welded to holdfast & other end to be fixed into jambs with 1:2:4 P.C.C. of dimensions as directed including making holes of required size in posts or frames, filling them with T.W. fillets properly etc. complete as per drawings no. CA/TD/055/00. No other method of fixing holdfast except that shown in this referred drawing shall be allowed to the contractor.
17. The contractor shall erect the frames & shutters etc. in proper alignment vertically & in workmanlike manner. The defects in this work if noticed/pointed out shall be rectified by the contractor at his cost. The contractor shall be responsible for protection of shutters & the frames fixed in masonry/concrete work during the progress of the work & till the buildings are handed over.
18. All wood work wrought & framed shall be measured net in cubic meters as fixed except in the following :-
The sectional area of mouldings, doors / windows / ventilators or fan light frames shall be taken as the area of the last square or rectangle from which the same will be cut.
Unless otherwise mentioned length of the door/ windows/ ventilators or fan light frames shall be measure out to out door i.e. the sight length of tenons shall be added. Vertical member of door frames shall be embedded in the buried length of frame will be added to sight length. Length shall be measure nearest to a centimeter. No horns shall be provided.
19. Hardware for doors, windows/ ventilators shall be of the approved brand as per list of approved brand/ makes.
20. All hardware shall be fixed with suitable screws to match the hardware & rates quoted shall include for fixing the hardware in position & cost of screws etc.

FLOORING & FINISHING

- Wherever specified terrazzo/marble mosaic tiles in flooring shall be of 250 x 250 x 20 mm of appd. colour & shade. Thickness of wearing layer of the tiles shall not be less than 6mm.
- Terrazzo/marble mosaic tiles of light shade shall be in white cement, medium shades shall be approximately 50% white & 50% ordinary cement & dark shades shall be in ordinary cement. The same shall apply in case of in situ terrazzo/marble mosaic, cement tiles & cement concrete floors if required to be finished in light, medium or dark shades. Rates quoted for light, medium/dark shades for tiles as well as for in situ terrazzo/mosaic & cement concrete finish shall include for necessary coloring pigment also.

3. Size of the marble chips for terrazzo/marble mosaic tiles shall be varying from the smallest upto 20mm size & shall be in required proportion & of approved colour & shade & rates quoted for terrazzo/marble/mosaic in situ mosaic finish shall include for the same.
- a) flooring & treads of steps/staircase shall be laid on a screed of lime mortar 1:3 (1 lime:3sand) or cement mortar 1:4 20mm thick average & floated in neat cement slurry.
 - b) Skirting, dado & risers of steps/staircase shall be fixed on backing of cement mortar 1:3, 12mm thick, with thick cement plaster.
 - c) Joints shall be finished neatly with white/coloured cement to match the colour of corresponding tiles/ stone.
 - d) Tiles/kota / shahbad/tendur stone slab in flooring shall be machine polished & tiles/shahbad stone in dado, skirting, treads & risers shall be hand polished.
5. Terrazzo/Marble mosaic/cement tiles shall be from any of the following manufacturers as per list of approved brand/makes.

6. MARBLE SLABS IN FLOORING AND LINING

GENERAL

Marble slabs shall be of the best Makrana Dongri Adanga marble or as specified in the item & from approved source. They shall be hard, dense, uniform & homogenous in textures. They shall have even crystalline grains & free from defects & cracks. The top surface shall be machine polished to an even & perfectly plane surface & edges machine cut due to square. The rear face shall be rough enough to provide a key for the mortar. Exposed edges of the treads/risers etc. of the entrance steps shall have machine polished edges. Marble slabs shall be of specified shape & size & shall be got approved from the Dy. Chief Engineer. No slab shall be thinner than the specified thickness at its thinnest part.

A. FLOORING :

Marble slabs in flooring shall be laid as follows & rates quoted shall include for the same.

- i) Marble slabs in flooring, treads of steps of staircase shall be laid on screed of lime mortar 1:3 (1 thoroughly slacked & only lime putty :3 sand) or cement mortar 1:4 20mm thick average & floated in neat cement slurry with necessary slope.
- ii) Joints shall be hair-fine width & in straight lines. They shall be grouted & finished neatly with white cement slurry of required consistency admixed with pigment to match the colour of the marble stone slab.
- iii) Flooring shall be given a coat or wax polish of approved make. Rate quoted shall include for the size of marble stone slabs as specified & for the pattern as shown on drawings.

B. MARBLE SLABS IN WALL LINING

Marble slab shall be of the best markrana Dongri Adenga marble from approved source. They shall be of selected quality, dense, uniform & homogenous in texture & free from cracks or other structural defects. Marble slabs shall be got approved from the Dy./ Chief Engineer before the incorporating the same in the work. The top surface shall be machine polished to an even & perfectly plane surface before they are fixed in position & shall have machine cut polished edges true to square. The dressed slabs shall be of the thickness as specified with a tolerance of $\pm 2\text{mm}$. the tolerance in wall lining when a straight edge of 4m. length is placed should not exceed more than 3mm. Marble slabs in wall lining shall be laid as under & rates quoted shall include for the same.

i) Cement mortar 1:3 pads of 12mm thick & of required width shall be struck on to the wall at close intervals & the marble slabs shall be pressed on to them firmly in pattern as shown on drawings. The remaining cavities if any, shall then be filled with thin grout of the cement mortar of the same proportion. The sound coming on gently tapping of the slab will indicate if there are hollows. When the hollows cannot be filled with grout & the finished slabs continue to give hollow sound tapping, the slab shall be removed & reset. The marble slabs shall be fixed to the wall by bronze cramps/holdfast 100 x 50 x 6mm size, 50mm long wide bronze angle 45 x 45, 1 1/2mm dia x 75mm long expansion bolts, brass wire hooks & bronze dowels pins 50mm x 6mm dia as shown on drawings. At horizontal joints of the slabs, adjacent slabs shall be held together by a bronze pin passing through a hole drilled in the slabs. In addition bronze cramps of above mentioned size shall be provided to anchor the slabs to the wall. The cramps/holdfast shall be counter sunk into the joints of slabs & it shall be located as shown on drawings. Minimum two such cramps shall be provided for each horizontal joint for each slab.

ii) The lining between marble slabs shall be hair fine & filled with white cement grout to match the marble.

iii) The lining shall be fixed true to plumb & in perfect line as shown on drawings. The surface shall be protected from sun & rain & cured for ten days & shall be finally hand polished before buffing with polishing felt pad & acid. The marble shall be finished with a coat of wax polish of an approved manufacturer.

Rates quoted shall include for the size of marble stone slabs as specified & for the pattern as shown on drawings. Granite stone/marble slab in wall lining shall have zero level edges & rate quoted shall include for the same.

7. In situ marble mosaic flooring, treads etc, shall be 40mm thick overall (under layer 30mm thick & top layer 10mm thick). In situ marble mosaic dado, skirting shall be 20mm thick overall (under layer 12mm thick & top layer 8mm thick). Under layer for flooring & treads shall be cement concrete 1:2 & for dados & skirtings, the mix for under layer shall be 1:3 cement mortar. The proportion of cement to marble chips of smallest to 20mm size in required proportion & in top layer shall be 1:2. Marble chips shall be of approved colour & shade. Flooring shall be machine polished whereas treads, skirting & dados shall be hand polished. Rates quoted shall incl. for all the above factors.

8. Cement concrete flooring when indicated to be coloured shall be rendered with 6mm thick cement plaster consisting of 1 part of ordinary cement to 3 parts of sand, coloured with addition of mineral pigment of Shalimar make or other equal & approved shade, thoroughly mixed cement when dry. The quantity of coloring pigment for coloured concrete flooring shall be such as to produce the required shade. This top layer of 6mm thick cement plaster mixed with coloring pigment shall be laid immediately after paying concrete for flooring.
9. Cement concrete flooring (Plain/coloured) laid in single layer shall be finished smooth & will have no trowel marks on the surface. If ordered, hand polishing with carborundum stones shall be included in the rates quoted.
10. Internal cement plaster to brick walls, columns, beams, lintels etc. shall be 12mm thick. R.C.C. slab soffits shall have cement plaster not less than 6mm thick. External cement plaster shall be 20mm thick in two coats (under coat 12mm thick & finishing coat 8mm thick) except for R.C.C. members not flush with brick work which shall be 12mm thick in two coats (under coat 8mm thick & finishing coat 4mm thick) such as R.C.C. facias, chajjas, canopies, drop walls, beams ribs, projected slabs etc.
11. Rates quoted for plastering & finishing items shall include for jambs, sills, drip mould, bands, forming grooves, chambers, curved angles, arises etc. & such other projections, which shall not be measured separately & paid for.
12. Rates quoted for painting & colour washing etc. shall include for providing shade of approved colour.
13. In case of painting, white washing & colour washing items, although number of coats are specified. Contractors will have to do additional coats if well finished surface is not obtained to the satisfaction of Executive Engineer & there shall be no extra payment on account of this.
14. Sand for mortar bedding for floors shall be from approved source & shall conform to IS : 2116 - 1965 as applicable to unreinforced masonry work.
15. Sand for plaster shall be from approved source & shall conform to IS : 1542 - 1960 as applicable internal wall & ceiling, plastering & external wall plastering.
16. Unless otherwise specified white glazed earware tiles shall be of 108 x 108mm size & minimum 5mm thick of first quality as per the list of approved makes/brands.
17. Acrylic plastic emulsion paint shall be of approved brand manufactured by any manufacturer as per the list of approved makes/brands.
18. Cement water proofing compound wherever mentioned shall be of approved brand manufactured by any manufacturer as per the list of approved makes/brands all as per manufacturer's specifications.
19. Flat oil paint for external or internal surfaces wherever specified shall be of approved brand manufactured by any manufacturer as per the list of approved makes/brands.
20. High class synthetic enamel paint (first quality) shall be of approved brand manufactured by any manufacturer as per the list of approved makes/brands.

21. Cement paint shall be cement water proofing decorative paint of approved brand manufactured by any manufacturer as per the list of approved makes/brands.

22. KOTA STONE:

Kota stone specified in the items shall be got approved from the CE. At its thinnest part no stone shall be thinner than the minimum thickness specified in the tender item. Kota stone used in the work shall be hard, sound, durable, resistant to wear. It shall be cut to shape & size as directed. Rough kota stone shall have plain surface.

For machine polished kota stone, the exposed surface of the stone slab shall be machine polished, having smooth even & true plane. The stone slabs shall be without any soft veins cracks or flaws & shall have uniform colour. Kota stone for floorings, skirting, tread 7 risers shall have even natural surface free from broken flakes on top & shall be machine cut, edges shall not be marred by careless dressing of slabs & patching up shall not be straight. Kota stone used in the work shall be brought from approved quarries.

23. TOLERANCE FOR TANDUR/SHAHABAD/KOTA FLOORING :

The thickness of the slab shall be as specified in the description of items. Tolerance shall be allowed for the thickness. In respect of length & breadth of slabs, a tolerance of 5mm shall be allowed.

24. CERAMIC TILES LINING :

FLOORING & DADO

Glazed / ceramic tiles shall be of approved brand manufactured by any manufacturer as per the list of approved makes/brands. The tiles shall be laid over the base coat of cement mortar 1:4, 20mm thick with a floating coat of thick cement slurry over it. Ceramic tiles shall then be set over the screed firmly to correct plumb line & levels. The joints shall be filled & finished neat with cement paste pigmented to the shade of the tiles. all as per detailed manufacturer's specifications. The tiles shall be cleaned with acid. Rates to include to the above besides scaffolding, curing etc. complete.

GRANITE WALL LINING/ VENEERED WORK

Dressing & rubbing

Every stone shall be mirror polished and cut to the required size and shape, dressed on all beds and joints so as to be free from waviness and to give truly vertical and horizontal joints as required, the back of stones shall be left rough cut, in order to ensure a good grip with the heating of backing. A sample of dressed stone shall be prepared as per required size and shape for approval and it shall be kept at site after being approved by Engineer-In-Charge. The dressed stone slabs shall be of the thickness as specified with a tolerance permissible as below :

SLABS :	a)	Length :	+2%
	b)	Width :	+2%
	c)	Thickness :	+3%

The tolerance in wall lining when straight edge of 3m length is placed should not be more than 2mm.

Mortar

The mortar used for fixing the stone shall be 1:3, (Cement : 3 coarse sand) and of the thickness specified.

LAYING

1. The stones shall be wetted before laying. They shall be fixed with mortar in position without the use of chips and underpinning of any sort. The care shall be taken to match the grains of veneer work as directed by the Engineer-In-Charge at site. Preferably the slabs shall be selected judiciously having uniform pattern of veins/streaks.

2. Where so desired, the adjoining stones shall be secured to each other by means of copper pins 75mm long and 5mm diameter or as specified.

3. Further the stones shall be secured to the backing by means of cramps. The material of the cramps shall have high resistance to corrosion under conditions of dampness and against chemical action of mortar or concrete in which cramps are usually embedded.

Cramps shall be of 25x6mm and 30cm long in case of backing of stone masonry walls and brick masonry walls thicker than 230mm. In case of backing with brick walls 230mm or less thick or RCC members cramps shall be of 25x6mm and length as per requirement made out of gun metal or any other metal as specified. Generally the outer length of cramp in half brick work backing shall be 115mm and in one brick wall backing it shall be 150mm. Typical details and shapes of cramps for such backing are as indicated in figure no. 2 for general guidelines. This can be modified as directed by Engineer-In-Charge if so, required at site. Cramps shall be spaced not more than 60cm apart horizontally.

Alternatively the stone may be secured to backing by means of stone dowels 10x5x2.5cm as per shape indicated in Figure 1.

3. The adjoining stones shall be secured to each other of gun metal cramps or copper pins of the specified size. The cramps may be attached to its sides (See fig. 3A,3B) or top and bottom (see fig. 3C,D,E,F) or sides top and bottom (see fig. 3G,3H). The general arrangements of cramps required for fixing facing unit to wall are illustrated in fig.3. The actual number of cramps and their sections, however, shall be as per requirements of design to carry the loads.

4. Where cramps are used to hold the unit in position only, the facings shall be provided with a continuous support on which the stone rests at the ground level and other storey levels, the support being in the form of projection from or recess into the concrete floor slab, or a beam between the columns or a metal angle attached to the floor slab or beams. These supports shall preferably be at vertical intervals not more than 3.5 m apart and also over the heads of all the openings. Such supports shall also be provided where there is transition from thin facings below to the thick facings above.

5. Alternatively the cramps may be used to hold the units in position and in addition to support the units thus transferring the weight of the units to the backing. Such cramps should be properly designed as per IS 4101 (Pt.I) – 1967.

6. The cramps may be of copper alloyed with zinc, tin, nickel, lead or stainless steel as specified.

7. The pins, cramps and dowels shall be laid in cement mortar 1:2 (1 cement : 2 fine sand) and their samples got approved by the Engineer-In-Charge and kept at site.

JOINTS

All joints shall be full of mortar, special care shall be taken to see that groundings for veneer work are full of mortar. If any hollow groundings are detected by tapping the face stones, these shall be taken out and relaid. The thickness of the face joints shall be uniform, straight and fine as possible, not more than 1.5mm and in the face joint, the top 6mm depth shall be filled with the mortar specified for the pointing.

Curing

The work shall be kept constantly moist on all faces for a period of at least seven days.

Protection

Green work shall be protected from rain by suitable covering. The work shall also be suitably protected from damage during construction.

Scaffolding

Double scaffolding having two sets of vertical supports shall be provided where necessary. The supports shall be sound and strong, tied together by horizontal pieces over which the scaffolding plank shall be fixed.

Measurement

The length and breadth shall be measured correct to a cm. In case of radially dressed or circular slabs in the work, the dimensions of the circumscribing rectangles of the dressed stone used in the work, shall be measured and paid for. The area shall be calculated in sqm nearest to two places of decimal.

STONE CLADDING WORK

Stone shall be of the type specified. It shall be hard, sound, durable and tough, free from cracks, decay and weathering and defects like cavities, cracks, flaws, sand holes, veins, patches of soft or loose materials etc.

Before starting the work, the contractor shall get the stones approved by Engineer-In-Charge.

The stone shall be cut into slabs of required thickness along the planes parallel to the natural bed of stone.

Dressing

Every stone shall be cut to the required size and shape, so as to be free from waviness and to give truly vertical and horizontal joints. They shall be hand or machine cut as per site requirement to the required thickness.

The dressing at the back shall not be done, so as to ensure better grip with the hearting or backing. The dressed slab shall be of the thickness as specified, with permissible tolerance of 2mm.

Mortar for fixing shall be as specified.

LAYING

The stone shall be wetted before laying. They shall be fixed with the mortar in position without the use of chips or underpinning of any sort.

Where so desired, the adjoining stones shall be secured to each other by means of copper pins 75mm long and 6mm dia. Or as specified.

Further stones shall be secured with the backing by means of cramps. The materials for the cramps shall be high resistant to corrosion under conditions of dampness and against the chemical action of mortar or concrete in which cramps are usually embedded. Cramps shall be of 25x6mm and 30cm long in case of backing of stone masonry walls and brick masonry walls thicker than 230mm. In case of backing with brick walls 230mm or less thick or RCC members cramps shall be of 25x6mm and length as per requirement made out of gun metal or any other metal as specified. Generally the outer length of cramp in half brick work backing shall be 115mm and in one brick wall backing it shall be 150mm. Typical details and shapes of cramps for such backing are as indicated in figure no.15 for general guidelines. This can be modified as directed by Engineer-in-Charge if so, required at site. Cramps shall be spaced not more than 60cm apart horizontally.

Alternatively the stone may be secured to the backing by means of stone dowels 10x5x2.5 cm as per shape in Figure 14 and the adjoining stones secured to each other by means of gun metal cramps or copper pins of the specified size. Minimum one cramp /stone dowel shall be used to secure one slab to backing.

Cramps may be attached to its sides (See fig. 16A, 16B) or top and bottom (see fig. 16C to F) or sides, top and bottom (see fig. 16G&H). the minimum number of cramps required for fixing facing unit to wall are illustrated in Fig. 16. The actual number of cramps and their sections, however, shall be as per requirements of design to carry loads.

Where cramps are used to hold the unit in position only, the facings shall be provided with a continuous support on which the stones rest at the ground level and other storey levels, the support being in the form of projection from or recess into the concrete floor slab, or a beam between the columns or metal angle attached to the floor slab or beams. These supports shall preferably be at vertical intervals not more than apart and also over the heads of all openings. Such supports shall also be provided where there is transition from thin facings below to thick facings below.

Alternatively the cramps may be used to hold the units in position and in addition to support the units thus transferring the weight of the units to the backing. Such cramps should be properly designed as per IS 4101 (Pt.I) – 1967.

The cramps may be of copper alloyed with zinc, tin, nickel, lead or stainless steel as specified.

The pins, cramps and dowels shall be laid in cement mortar 1:2 (Cement : 2 fine sand) and their samples got approved by the Engineer-in-Charge and kept at site.

The walls shall be carried up truly plum. All courses shall be laid truly horizontal and all vertical joints truly vertical. The stone shall break joints on the face for at least half the height of the course, unless otherwise shown in the drawings. The stone shall be laid in regular courses not less than 20cm height and all the stones shall be of the same height unless otherwise specified. No stone shall be less in length than one and half times its height unless otherwise specified.

As far as possible the backing shall be carried up simultaneously with the face work. In case of reinforced cement concrete backing, the lining shall be secured to the backing after it has set and got cured. The cramps shall be fixed in concrete at the required positions, while laying.

JOINTS

The joints shall be done with cement mortar 1:2 (1 cement : 2 fine sand). All joints shall be full of mortar. Special care shall be taken to see that the groundings for veneer work are full of mortar. If any hollow groundings are detected by tapping the face stones, these shall be taken out and re-laid. The thickness of joints shall be as small as possible, not exceeding 5mm. For a close butt jointed facing the thickness shall not exceed 1.5mm. The face joints shall be uniform throughout.

Where joint filler or compound is to be used the joints shall be raked out to a depth of at least 25mm after the mortar in the joints has set sufficiently and the filler or compound applied. The joints may be subsequently finished with a mortar suited to the appearance of the work. It is preferable to use joint sealing compounds where the facings are exposed to heavy rainfall and winds and their selections would depend upon local experience and availability of joint sealing compounds. In their absence only masonry mortars 1:2 (1 cement : 2 sand) which are proved to be successful from local exposure conditions shall be use.

MEASUREMENTS

The length and breadth of the finished work shall be measured metre correct to cm. The area should be calculated in Sq.mt. correct to two places of decimal.

RATE

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

8. WATERPROOFING & ROOFING

a) Water proofing to sunken portion of floor slabs in W.C. bath etc. The treatment shall consist of following operations:

i) 20mm thick plaster with cement mortar 1:4 mixed with any approved waterproofing compound as per manufacturer's specifications over the slab & sides upto the top of sunken portion.

ii) Filling the sunken portion with well burnt bricks in required number of layers set in cement mortar 1:4 mixed with approved water-proofing compound as per the top surface as per required gradient to receive the floor finish.

iii) The treatment shall be guaranteed as detailed under b(ii) below.

b) TREATMENTS OVER ROOFS :

i) The waterproofing shall be got done from anyone of following proprietary specialist firms & under their direct supervision & strictly in accordance with their specifications.

ii) the treatment shall be guaranteed against any seepage/leakage/ dampness etc. for a period of ten years from the handing over of the building to L.I.C. The guarantee shall have to be given by the proprietary specialist firm directly to the L.I.C. of India. on judicial stamp paper in approved proforma of the L.I.C.

The amount @ 10% shall be deducted from R.A. Bill/Final bill from the items of water proofing trade having 10 years guarantee. (i.e. terrace water proofing treatment, khurras, addl. Thickness, plastering and brick bat filling in sunken portions).

The 50% of retention money for this trade will be refunded after expiry of the two successful monsoons balance 50% will be refunded expiry of guarantee period of 10 years provided that there is no leakage, dampness etc.

iii) The rates shall include testing of the treated areas by ponding with water, the water shall be made to stand for 120 hours in 150mm ht. average the period of testing. In case of leakage/dampness the same shall be rectified completely & testing shall be redone until all treated surfaces are found to be free from any leakage/dampness/seepage.

iv) Min. thickness of treatment shall be 75mm. The slope of the finished treatment shall not be flatter than 1 in 120.

v) For the purpose of payment exposed area (in plan) of the RCC slab treated shall be measured (i.e. area before treatment / plaster between parapet/wall etc. & vertical surfaces shall not be measured. In case of sloping roof slab exposed area of the inclined portion shall be measured. Rounding of junctions at terrace will not be measured or paid for separately.

vi) The quoted rates shall be valid at all hts. & all floors.

1. CRAZY MARBLE MOSAIC FLOORING/TOPPING ON TERRACE.

Work of crazy marble mosaic tile topping on terraces are given in the specifications for civil work :

Rates quoted shall include for the following factors :

i) Tile piece shall be laid on screed on lime mortar 1:1:1 (1 cement: 1 surkhi: 1 sand) 20mm thick (average) & floated on neat cement slurry in required levels & slopes in crazy fashion.

ii) The joints between the pieces shall not exceed 3mm in width & shall be slidly filled with cement mortar 1:3 mixed with waterproofing compound & finally flush pointed on top with neat cement mixed with water proofing compound.

iii) Cement waterproofing compound of approved brand manufactured by any manufacturer as per the list of approved makes/brands all as per manufacturers specifications shall be added to components of the above mentioned screed float of mortar bedding & cement floating coat.

iv) The junction of the topping/paving & the parapet wall shall be rounded/covered to about 75mm radius & the topping/paving shall be extended up to the parapet wall for 15cm. The top edge shall be finished in a neat horizontal line & tucked in groove in the wall. Bel mouths around rain water pipe inlets etc. wherever required for affecting drainage, shall be formed in crazy marble mosaic tile piece finish. Necessary channels/dishing as required shall be also formed.

v) After the topping/paving has been laid as required or the day's fixing work is completed the surplus cement grout that may have come out of the joints on compacting shall be cleaned off.

- vi) Proper slopes shall be imparted to the finished surface to drain off the rain water easily without any stagnation & where on the finished surface.
- vii) Bitumen painting of slaw small extend up the parapet/kerb/upstand for 150mm.
- viii) Necessary roundings/covers near parapet/kerb/upstand shall be done & junction made leak-proof.
- ix) Dishing near rain water outlets.
- x) Preparation of channels as required.

2. MEASUREMENTS

- i) Measurements for lime concrete as well as for crazy marble mosaic flooring/copping on terrace shall be only the respective flat area in plan of the terrace between the exposed internal faces of parapet walls/curbs/up stands portions, coving rounding etc. shall not be measure.
- ii) While measuring the average thickness mentioned in the item, thickness of roundings/coves near the parapet walls/curb and the portion carried over in the parapet walls shall not be considered.
- iii) Wherever the R.C.C/Brick/Stone/Corbelling courses are required to be provided on the same terrace floor, they shall be in line & level with each other.
- iv) The contractors shall ensure water tight/leak proof construction. The contractor, if they so desire may carry out any further treatment (in addition to the water proofing treatment specified above) for water proofing of surface as considered necessary by them, however, the rates quoted by them for the items shall be deemed to allow for such additional treatment & no extra amount shall be paid for the same.

9. MISCELLANEOUS WORK & ALUMINIUM WORK

- I. All aluminium work shall be free from defects impairing strength, appearance & shall be of the best available quality for the purpose specified. The aluminium alloy used in the manufacturer of the extruded doors/ windows/ ventilators/ partitions sections shall correspond to IS designations HE 9-WP of IS : 733 – 1956. "Specifications for wrought aluminium & aluminium alloy bars, rods & sections (for general Engineering purposes)". Hollow aluminium sections & coupling sections used shall conform to IS designation HV 9-WP & Aluminium alloys extruded round tube & hollow sections (for general Engineering purpose only. Contractors shall commence manufacturing of doors, windows, & ventilators only after the shop drawings showing full size, sections, thickness of metal, details of construction, hardware etc. submitted by them are approved by the Employer.

Where aluminium comes in contact with concrete, brickwork, plaster or any other dissimilar metals, it shall be coated with & coat of zinc chromate conforming to IS : 104 – 1950. Contractor shall cover all the anodized finish work with a thick layer of clear transparent lacquer base on methacrylates or cellulose butyrate to protect the surface from wet cement during installations. This lacquer coating shall be removed after the completion.

All the manufactured doors, windows, ventilators & partitions shall be stacked on site under cover. Damaged surfaces with defects like scratches etc., on finished work shall not be accepted. Fabricated materials shall be created in an approved manner to protect the material against any damage during transportation. Loading & unloading shall be carried out with utmost care. The doors, windows & ventilators on arrival at site shall be carefully examined to detect any damaged pieces. Arrangements shall be made for expeditious replacement of damaged pieces/parts. Materials found to be acceptable on inspection only shall be used.

All exposed surfaces of sections for aluminium doors/windows/ventilators/partitions incl. beadings & other accessories shall be anodized/powder coated after fabrication, in a manner conforming to IS : 1868 - 1968 & to approved finish. Anodizing/powder coating shall be in matt finish natural colour & anodic coating shall be of a minimum thickness of 15 microns. Powder coating shall be of minimum thickness of 60 microns with approved Epoxy/ pure polyester paint powder all as per the specifications of specialized agencies.

2.

ALUMINIUM DOORS, WINDOWS, VENTILATORS & PARTITIONS.

Aluminium doors, windows & ventilators shall be manufactured from sturdy extruded sections of approved manufacture & shall be aluminium alloy from one of the manufacturer/s as given in the attached list of approved makes.

Contractor shall design & provide sturdy sections/members of doors, windows, ventilators & partitions including combination of joints so as to withstand wind load of high intensity.

The frame shall be square & flat & corners of the frames being fabricated to true right angles. Both the fixed & opening frame shall be of sections which have been cut to length, metered & mechanically joined &/or electrically welded at corners as required for satisfactory performance. Sub-dividing bars shall be accurately machine milled & fitted to form harline joints. The jointing accessories such as cleats, brackets etc. shall be of such material as not to cause any bi-metallic action.

Dimensions shown in the drawings are overall height & width to the outside of the frames of aluminium doors, windows & ventilators. These dimensions are derived after allowing 12.5mm clearance on all four sides for the purpose of fittings windows, doors & ventilators into the openings. Contractors are advised to verify the dimensions before fabricating & fixing the doors, windows & ventilators in position.

3.

METHOD OF FIXING

a) Aluminium doors, windows, ventilators & partitions in brick work & concrete work :-

Aluminium doors, windows, ventilators & partitions shall be fixed to brick work by means of slotted steel adjustable lugs (natural finish), not less than 100mm x 16mm x 3mm with counter sunk galvanized machine screws & nuts 19x6mm & to concrete work by means of 45mm x No 10 galvanized wood screws & dash fasteners of suitable size & make.

b) **FIXING SCREWS AND LUGS.**

Outer frame shall be provided with fixing holes centrally in the web of the section at appd. intervals. Any steel lug coming in contact with aluminium should either be galvanized or given a coat of bituminous paint. The members should be designed not only for its strength, stability, stiffness, against all odds, but also for easy operations, water tightness, easy replacement of glass & cleaning from inside. All screws used shall be of adequate size & shall be of cadmium plated brass.

4. **GLASS AND GLAZING**

Glass shall be of type & quality specified in the schedule of quantities & manufactured by one of the manufacturer as per the list of approved makes. Before installation of the glass the contractor shall ensure the following :-

- a) All glazing rebates shall be square, plumb true in plane, clear, dry & free from dust.
- b) The glass edges shall be clear & cut to exact size, glass with chipped or damaged edges shall be rejected.
- c) The glass shall be set in glazing clips & be installed to achieve proper water tightness.
- d) Suitable PVC or Neoprene gaskets shall be used for fixing glass so as to prevent rattling.
- e) Beading shall be of anodized aluminium section and shall be snap-on type having mitred either triangular or rectangular as per contractor's design & shall not be less than 0.13 kg. per RM.
- f) Any hollow portion between the frame & the brick / concrete surfaces & the component parts of the frame shall be filled up with suitable mastic/cement & sand filled as per IS specifications & rates quoted shall include for the same.
- g) If required by the Dy. Chief Engineer putty shall be applied to the face of the bead which is in contact with glass. Putty would also be filled, if necessary at the back. Putty used for glazing shall conform to I.S. 420 - 1953. On completion of the job, all glass shall be thoroughly cleaned & free from dirt, putty or other adhering material.

Wastage of cutting of glass shall be to contractor's account. Frosted/ground/pin headed glass shall be set with smooth surface outside.

The members proposed to be provided by the contractors for aluminium doors, windows, ventilators & partitions shall be of approved quality & sturdy to withstand the wind pressure of high intensity & day to day handling & shall be free from rattling, leakage etc. if required, contractor shall furnish the detailed design calculation to substantiate the sturdiness of each door, window, ventilator & partitions, the same shall be carried out by the contractor & suitable adjustment shall be made on basis of relevant tender items.

5. Aluminium doors, windows, ventilators & partitions shall be locally manufactured as per the design & drawing (which shall be approved by the Employer), from the extruded sections of one of the manufacturer/s as given in the attached list, including fittings & fixtures as shown on drawings.

6. The Dy. Chief Engineer reserves the right to delete any or all items of this trade & allot the work under this head to any specialized agency/agencies. No claim what ever shall be entertained on this account.

7.

MODE OF MEASUREMENT.

Aluminium doors, window, ventilators & partitions shall be measured by weight only. The weight shall be calculated as per theoretical weight/ actual weight whichever is less. Any wastage of aluminium sections shall be on contractor's account. The weight of screws, lugs, nuts & bolts, butt hinges, hollow hinges, neoprene gaskets, hardware fittings & fixtures shall not be considered for payment. The rate shall include for fixing of fittings & fixtures shown on shop drawings approved by Engineer-in-Charge.

9.

RATE TO INCLUDE:

Apart from other factors mentioned elsewhere in this tender document, rate for the items of supplying & fixing aluminium doors, windows, ventilators & partitions shall also include for the following, unless otherwise specified :-

- a. All materials & labour required for supplying & fixing in position approved anodized/powder coated aluminium doors, windows, ventilators & partitions & described in the trade at site of work.
- b. After the shop drawings are approved, the contractor shall supply one sample each of window & ventilator with hardware etc. for approval as directed.
- c. Supplying & fixing in position glass of specified thickness, type & quality along with putty, glazing clips & anodized/powder coated aluminium beading of required section.
- d. Supplying & fixing all accessories such as hinges, cleats, beading, screws, nuts, bolts, lacquer, gasket, putty for fabrication & fixing doors, windows, ventilators & partitions to concrete/ masonry surface as described in the trade.
- e. Filling sealants as per details to ensure water tightness. All the sealants must be permanently resilient & non bleeding nature.
- f. Protecting the surfaces & edges around doors, windows, ventilators & partitions from any damage while fixing the same.
- g. Removing all protective coverings & cleaning the door, window, ventilator & partition frames.
- h. Neoprene / PVC weathering strips as required.
- i. Drip strip to drain out water falling on the members of the frame.
- j. Filling in cement mortar 1:4, the space between the concrete surface & the frame windows & ventilators.
- k. PVC or rubber gasket for fixing glass.
- l. Cadmium plated brass screws wherever required.
- m. Galvanized/ aluminium channels pieces, coach screws, rawl plug etc. of required size & number for fixing door, windows, ventilators & partitions frames in position.
- n. Necessary scaffolding/cradle for erection of aluminium doors, window, ventilators & partitions in position.

- o. Rates for sliding windows & ventilators to include for adequate arrangements for draining out water collected in the channel of the outer frame.
- p. All rates quoted in the trade shall include for supplying & fixing.
- q. Swing door shutters shall include for double action oil check floor springs of "Everite" or "Hardwyn" other equal & approved make & size including embedding the floor springs in the flooring & making good the same.
- r. For all window & ventilator openings, contractor shall prepare M.S. retrievable plate frames with necessary tolerance for obtaining the correct dimensions of opening in concrete/brick masonry works.

10. & 11. SANITARY, WATER SUPPLY, PLUMBING & DRAINAGE WORK

1. GENERAL

These preambles apply to all the sections of the "Schedule of Quantities" although they may not be repeated later.

- 2. In case any variation or discrepancy is found between the description in the schedule of quantities will take precedence over the specifications for Sanitary work.

3. RATES TO COVER:

a) - Whether specifically mentioned or not, the contractor should cover in the rates quoted by him in the Schedule of quantities, for all the conditions, materials & labour (up to incorporation, in acceptable work) covered in the preambles. The contractor should also cover in his rates for the method of work, cost of materials, labour etc. to comply with the "General Specifications", "Special conditions" (if any) & all documents of this contract.

b) The contractor's rates shall cover for all materials, tools & plants, scaffolding & everything necessary, for the proper execution of the work to the satisfaction of the C.E. All materials & workmanship used in the execution of the work shall be the best or first quality & description, unless otherwise stated. All materials or procedure or specifications for work, unless otherwise stated, shall conform to the current Indian Standard whether or not specific mention made thereof. The contractor shall be responsible for, & shall replace or make good at his own expense, any materials lost or damaged, or of quality not approved.

- 4. **SUPPLY & FIX** - All rates quoted shall include for "Supplying & fixing" although the same may not have been mentioned in the item of the schedule of quantities. Words "Providing & fixing" where used shall have same meaning as "Supplying & Fixing".

- 5. **DESCRIPTION OF ITEMS CLARIFICATION** - Description of item shall mean its description in all relevant parts of the tender including that described in these preambles. General specifications, General instructions etc. Every care is taken to describe an item as clearly as possible if meaning or any of the items is not clear, the contractor is advised to have the clarification in writing from the office of the Dy. Chief Engineer.

- 6. **PRICE FLUCTUATION** - Rates quoted by the contractor shall be firm throughout the currency of the contract (including extensions of item, if any, granted & will not be subject to any fluctuation due to variation in cost of materials/labour).

7. The C.E. reserves the right to increase or decrease &/or revise the scopes of contract if required at his own discretion & the decision of the Dy. Chief Engineer in this respect shall be final & binding to the contractor. No claim what so ever from contractor on this account will be entertained.
8. **WORK TO BE COMPLETED WITH CIVIL WORK** – The work involved in this contract shall be completed along with civil work. If any extensions to the civil work is granted or if civil work gets extended beyond its expected date of completion for any reason what so ever & for any period of time a corresponding extensions of time will be granted to the Sanitary contractor for completion of his work. No claims whatsoever by the sanitary contractor on account of any delays in the completion of the civil work will be entertained by the C.E.
9. Contractor shall be required to extend the maximum co-operation to the other contractors like those involved in of civil work, electrical work, road work etc.
10. The work involved calls for a high standard of workmanship combined with speed.
11. The contractor shall have to carry out all ancillary & connected works within the boundary of the plot of the proposed work & inside the building if ordered to do so by the Dy. Chief Engineer at the rates quoted in the schedule of quantities, at any time during the currency of this contract including extension of times, if any granted.
12. **SAMPLES** – The contractor shall at his own cost, furnish at the earliest possible opportunity before work commence any samples of materials or workmanship that may be called for by the Executive Engineer for his approval & any further samples in case of rejection until such samples are approved. Such samples when approved shall be the minimum standard for the work to which they apply. Rates quoted shall cover for such preliminary work, which shall not be paid for separately.
13. The executive Engineer reserves the right to fix the order in which the various items of work involved in this contract are to be executed & contract shall comply with the same. There shall be no extra claims on account of this.
14. Contractor should ensure that each & every quoted rate is workable & self supporting. If called upon by the Dy. Chief Engineer detailed analysis of any or of all rates shall be submitted. The Dy. Chief Engineer not bound to recognize contractor's analysis & reserves the right to reject abnormal rates quoted by the contractor. In case there are inconsistencies in the rates for items of same schedule of quantities the lowest of such rates will be considered as the rate for all such items, unless Dy. Chief Engineer finds that there justifications for such inconsistent rates.
15. All work shall conform to the description given for each of the items, in addition to the bye-laws of the Municipality/ Public Health Authority within whose jurisdiction the items are to be executed. Contractor shall obtain approval to drainage & water supply work & work shall be considered as complete only when the contractor produces "No objection & completion Certificate" from the Municipal/ Public health Authorities. Rates quoted shall include for the same.
16. All sanitary & plumbing work shall be carried out through licensed plumbers, as per the bye-laws & regulations of the concerned Municipal Authorities.

The contractor shall complete all the formalities of local/Municipal Authorities in respect of the work covered under this tender including getting the water supply & drainage plans approved. After completion of work the contractor shall obtain the drainage & water supply completion certificate including water sufficiency certificates from the Municipal Authorities. No charges whatsoever, either professional of Municipal including any deposit of any other charges required to be paid for getting the materials tested & approved from the Municipal Authorities etc. obtaining permission, certificates etc. will be paid to the contractor & the rates should be based accordingly.

17. All joints in piping shall be made properly so as to be mechanically sound & leak proof & shall satisfy water & smoke test. Leaking or sweating joints shall be remade to Executive Engineer's satisfaction at contractor's expense.
18. Rates quoted shall allow for the following :-
 - a) Excavation in all types of soils except in hard rock, refilling & carting away surplus materials to contractor's own dump or as directed, for manholes inspection chambers, gully traps water supply & drainage lines & appurtenances.
 - b) All subsidiary fastenings, fittings & fixtures required even though they may not have been specifically described under particular items.
 - c) All fittings fixed to walls will have approved clamps fixed to wooden plugs.
 - d) Two coats of approved ready mixed paint over red oxide primer to all exposed iron or wood work including C.I. brackets, G.I. pipes & C.I. pipes. All G.I. pipes whether laid in ground or concealed in walls or floors shall be coated with bitumen, wrapped with Hessian & again coated with bitumen. All C.I. pipes fixed in chases or concealed in floors shall be given three coats of white zinc or any other colour over a red oxide primer. Lead pipes shall be painted in similar manner as C.I. or G.I. pipes. A.C. pipes shall be painted to match the surrounding finish.
 - e) Making holes through concrete/masonry, making good the work & re-doing & plastering the same to match the surroundings.
 - f) For all pipes, rates shall be inclusive of all fittings & specials such as couplings, bends, unions, sockets, shoes, cleaning eyes, tees, plugs, reducers, offsets etc. & making joints & connections to valves, tanks pumps & existing pipe lines etc. as required.
 - g) Cutting chases for concealing pipes in wall & floors & making good with cement plaster.
 - h) Fixing of drainage pipes & rain water pipes 5cm away from the wall by means of holder bats fixed to wooden plugs.
 - i) Rates quoted shall include for hoisting to & work at all levels & lift of materials shall not form any criterion for any extra claims.
 - j) Cutting into existing manholes/chamber above the invert level of the existing drain but without drop arrangements & not disturbing existing benching of manhole/chamber including making good the same.
 - k) Disinfection & flushing of water supply mains as directed.

D) Testing the installations by smoke & water test.

19. The contractor shall be responsible for the adequacy & efficiency of the entire plumbing system & if in his opinion he finds any serious objections to the system shown on the drawings he shall get forth his objection of his suggestion to ensure adequacy & efficiency of the said system & notify the Dy. Chief Engineer before proceeding with the works.
20. The work should be executed simultaneously with completion of the General Building work & the contractor shall take care to see that no damage or breakage is done to work once it is constructed & finished. The sanitary work should be so adjusted that it does not hold up the general construction or other contractor's works.
21. All the sanitary ware & fittings shall be white glazed vitreous china of approved make.
22. Unless otherwise specified pipes for water supply shall be "Medium" quality galvanized steel tubing (b class) of approved make, welded & seamless & socketed.
23. All C.I. pipes & fittings shall be of heavy quality & approved make.
24. Plumbers brass work or gunmetal valves & fittings shall be of heavy quality & of approved make with tested ISI mark. All sanitary appliances, pipes, & fittings shall be of approved make & brand as per list of approved makes brand of materials mentioned elsewhere in the tender.
25. Rates for items with excavation shall include for shoring, timbering, strutting etc. for protection of excavated sides, bailing, out water due to rains of subsoil water of encountered & dewatering by pump wherever required until all work below water level is finished to the satisfaction of the E.E.
26. The proportion of mixes for concrete work is by volume, cement shall not however be measured by volume, but shall be measured by weight. One bag of cement containing 50kg. of cement shall be assumed to contain 35 lit. (1.20 Cft.) Unless otherwise specified, ordinary Portland cement shall be used complying with the requirement of latest specifications.
27. Bricks used for construction of manholes, gully trap chambers etc. shall be table moulded & from approved source. Bricks shall be well burnt, first quality, having regular shape with sharp corners & edges. It shall not absorb water more than 20% of the its own weight when dry.
28. The thickness of plaster where specified is the minimum thickness required over the proudest part of the wall & all dubbing out shall be included in the rates quoted. Sand for mortar & plaster shall be clean, free from salt, loam, clay, shells, vegetable matter & fit for use in the opinion of the E.E.
29. Cement waterproofing compound wherever mentioned shall be of approved make & used as per manufacturer's specifications, the rates quoted for items where water proofing compound is specified shall include for the same.
30. The contractor shall obtain all necessary permission, fill up all the requisitions, test reports etc. He shall include all such costs incidental to the work. The contractor shall obtain drainage completion certificate & water sufficiency certificate from the authorities without any obligation.

31. C.P. shall mean Chromium Plated.
R.C.C. shall mean Reinforced Cement Concrete.
P.C.C. shall mean Plain Cement Concrete.
C.I. shall mean Cast Iron.
G.I. shall mean Galvanized Iron.
A.C. shall mean Asbestos Cement.
P.V.C shall mean (Unplasticised) Polyvinyl Chloride.
I.S.I. shall mean Indian Standard Institutions.
W.C. shall mean Water Closet.
I/C shall mean Including.
P/F shall mean Providing & Fixing.

LIFE INSURANCE CORPORATION OF INDIA**TECHNICAL DETAILS FOR ELECTRICAL INSTALLATION WORK****T.D. 1:**

All items of works are to be carried out strictly as per I.E. Rules, 1956, IS : 732, IS : 3943-1966 or their latest version. In case the tenderer observes any deviations in the provision made in Schedule of works vis-à-vis provision of the above given publications, he is advised to bring it out clearly while making his offer.

T.D. 2:

- a) Main switches beyond 60 Amps Ratings should be provided with H.R.C fuse units. Rewirable switch fuse units beyond 60 Amps will not be acceptable.
- b) Make :- Upto and inclusive of 60 Amps Rating as per specifications. All switches of 100 Amps rating and above – ENGLISH ELECTRIC, SIEMENS, LARSEN & TOURBO, or as specified in schedule of quantities.
- c) **Installation:** Rates quoted by the tenderer should include for the following work unless stated otherwise.
 - i) Installation of switches on slotted angle iron frame work of adequate section. The main panel board is to be installed on the floor with adequate supports from wall at the back to make the entire arrangement adequate sturdy.
 - ii) Connecting the main switch with meter, bus bar distribution board with adequate length and section of PVC Insulated leads in M.S. conduit or flexible conduits as per requirement of site.
 - iii) Labelling of the switches to indicate clearly the area or the load being controlled by them.
 - iv) Connecting the earth wire run along with mains/cables etc. to the earth line by providing a suitable socket etc.
- d) **BUS BAR:**
 - i) All bus bars are to be made of tinned copper strips of the given section.
 - ii) Unless specified otherwise all bus are to be designed taking maximum current density as 800 Amps per Sq. inch.
 - iii) All bus bars are to be covered with PVC sleeves of red, yellow, blue and black colours to indicate various phases and neutral bar clearly. Alternatively, PVC insulation tape of the afore mentioned colours is to be used for identification of phases and neutral as indicated above.
 - e) All locally fabricated elements of the Main panel board (such as angle iron fram work, bus bar chamber, distribution board etc.) should be provided with the final quote of battle ship grey paint (Synthetic enable) after erection and before commissioning and all switches, bus bars, distribution boards provided to main panel boards are to be leveled.

T.D. 3:

Contractor is to supply 'English Electric' make rising in with tap off boxes complete and other accessories like I boxes etc. Contractor's responsibility is to supply and installed the 'English Electric' rising main. Rates quoted by the contractor should include .

- a) Supplying the 'English Electric' rising main with tap-off boxes and accessories.
- b) Installing the Rising Main trunking on brackets made of M.S. Angle Iron/Flats channel section of required thickness linking of tap off boxes for floors, including grouting the brackets in the wall of the Electrical shaft. The proposed arrangement for grouting is to be got approved by LIC of India's representative for the work.
- c) Running the double run of 25mm x 3.15mm copper tape on the body of the trunking and connecting the same to earth continuity conductors run along with the cable.
- d) After installation general checking and clearing the rising mains before commissioning.
- e) Final cost of painting of shade – same as that provided on the rising main trunking including labeling.

T.D. 4:

- a) Drawing showing details of installation indicating very clearly the sections of slotted angle iron proposed to be used, the depth to which members are to be grouted inside the wall, made of their support at the floor level including grouting inside the floor should be got approved by the contractor before actual execution of work.
- b) The drawing showing the arrangement of the main distribution boards, floor distribution boards showing the actual dimensions of switchgears, bus chambers, distribution boards etc. should be got approved by the contractor before fabrication.
- c) After execution of the work the contractor has to submit completion reports with drawings of the entire installation showing the manner in which the work has been actually carried out in triplicate to LIC of India. This is in addition to the drawings which the Contractor's is requires to submit with the completion reports/tests reports he has to submit as per the requirement of local electric supply company.
- d) It is the responsibility of the contractor to attend to the inspection of the installation if carried out by the inspecting authority of the State Govt. As mentioned in T.D. 1 since the works are to be carried out strictly as per I.E. Rules and relevant Indian Standard Specifications, the defects indicated by the above given Inspecting authorities will have to be rectified by the contractor at no extra cost to LIC of India.
- e) The rates quoted by the contractor will be taken as inclusive of all services which he will be required to render to obtain electrical services connection.
- f) To the premises, in case it is observed that the contractor is lacking in efforts to obtain Electrical service to the premises, Chief Engineer at his discretion may recover liquidated damages at the rate as mentioned in clause – of the general conditions of contract for delay in availability of electrical service and consequent delay in commissioning of the installation.

- g) It will be the contractors responsibility to check the concealed conduit work carried out by the Builders contractor with in a period of one month of taking over of site and to certify that the concealed conduit work is in order. In case the contractor fails to point out any defect with in this period, it will be taken for granted that the concealed conduit work has been found by the contractor in order and no further complaints in this regard will be entertained. After this, all rectification work will have to be carried out by Electrical Contractor at his cost.

T.D. 5:

- a) Insulated cables are to be on the walls, beams, ceiling etc. by providing plugs of well seasoned wood, cemented into the walls to with in 6.5 mm of the surface. Within the electrical shaft, the cables are to be run on M.S. clamps made out of angle, channel or flat section of required thickness grouted in the walls securely. The cable trenches in the Meter room in which the cables have been laid are to be filled up with sand.
- b) The underground cable run in the trenches are to be laid in suitable dia Hume pipe at all road crossings.
- c) All cable terminations inside switches, bus bar distribution and switch boards should be made in a workman like manner by providing sockets of suitable amperage, compression glands of suitable dia, porcelain connectors etc., as required. Rates quoted should be inclusive of all these accessories and nothing extra will be considered on these counts.
- d) Measurements for mains and cables will be taken as per IS : 5908 – 1973 or latest version of it.
- e) Conduits containing PVC insulated wires for mains/sub-mains/circuits/point wiring are to be painted with 2 coats of synthetic enamel paints of British Paint/Jenson Nicholson/Shalimar/Asian brand to match with the finished wall surface. The rate quoted should be inclusive of the cost of painting as mentioned here.

T.D. 6:

- a) All rates quoted for point wiring should include for providing circuit wiring by means of 2x2.5 sq.mm PVC insulated and PVC sheathed wires.
- b) The T.W. Battens/Boards etc., are to be fixed to the wall beam/column/ceiling surfaces by means of good quality M.S. screws.
- c) The pint wiring work is to be carried out in looping back 'System of wiring' and as such wooden junction boxes are not to be used in the run of point wiring for joining point wiring conductors.
- d) The rate quoted should provide for either painting the wooden switch boards or polishing the same as per the requirement of LIC's representative.

T.D. 7:

- a) The work of providing earth electrodes is to be done strictly according to IS: 3043-1966 or its latest version.
- b) For pump motor sets pipe-electrodes are to be provided where as for other electrical installation plate electrodes are to be provided unless stated otherwise.

- c) The work of provision of earth stations should include in additions to provisions of earth electrodes bringing the earth leads out upto the panel boards in case of electrical installation and up to test terminal block installed at a height of 2.75 meters, from the ground level in case of lightning conductors. The measurement for each leads, if included in the schedule of work and payable separately will therefore, exclude the above length of earth leads.
- d) The earth electrodes are to be installed minimum 4.5 metres away from the premises

CERTIFIED

1. That the rates are quoted after actually visiting site of work and acquainting with working condition and
2. That we have carefully studied the conditions of contract and specifications for material and workmanship and will adhere to the same.

SIGNATURE OF CONTRACTOR

SPECIFICATION FOR ELECTRICAL INSTALLATION WORKS IN
LICI BUILDINGS SUBJECT TO THE GENERAL
CONDITIONS OF CONTRACT IN FORCE.

GENERAL.

1. The installations shall generally be carried out in conformity with the code of practice for electrical wiring installation (system voltage not exceeding 650 V). Viz. IS : 730-1963 of the latest revision thereof.
2. Definition : As given in I.S. code of Practice shall apply.
3. Pressure and frequency of supply : All current consuming devices shall be suitable for 433 V. three phase, 50 cycle A.C. supply.
4. System of wiring :
 - i) The wiring shall be carried out as per schedule, "Power" wiring must be in screwed conduit and shall be kept separate and distinct from lighting wiring. All wiring must be done on the distribution system with main and branch distribution boards at convenient centre and without isolated fuse. All conductors shall be run as far as possible along with walls and ceilings so as to be easily accessible and capable of being thoroughly inspected. The balancing of circuits will be arranged before hand by the Corporation Engineer.
 - ii) The Contractor shall supply within a month from the date of taking over installations to the Chief Engineer, a complete set of wiring diagrams of the installations on the drawing supplied to him for Chief Engineer's approval. The said wiring diagrams when approved by Chief Engineer shall be deemed to be 'Drawings' within the meaning of the terms as used in the general conditions of contract.
5. Conductors :

The conductors shall be of aluminum and shall be either PVC insulated or PVC sheathed. The minimum sections of conductors used for wiring of light and plug points shall be 1.5 sq.mm. Single core wires shall not be used.
6. Cables :
 - i) All cables including flexible cables used shall be ISI approved and conforming to the ISI specifications.
 - ii) Twin flexible cable shall be of minimum sectional area of 14/0.0076 and PVC insulated.
7. Rating of Lamps & Fans : In estimating the current to be carried by any conductors, glow lamps are to be rated, as of 4 and 1.25 watts per candle power for carbon and metallic filament lamps respectively where the conditions are known, otherwise at 60 watts except in the case of gas filled lamps. Ceiling fans are to be rated at 80 watts, table fans at 80 watts unless actual values are known or specified.
8. Fall of Potential :- The cross sectional area of all conductors inside buildings shall be so proportioned to their lengths that the drop in pressure between the main fuses and the furthest or any lamp shall not exceed two percent, with all the consuming devices in use.

9. Test : The installation with fittings complete shell, before current is switched on, satisfactorily pass the followings tests :-

The whole of the lamps and appliances having been connected to the conductors and all switches and fuses being 'on' a pressure not less than twice the intended working pressure subject to a limit of 500 volt shall be applied and the insulation resistance of the whole or any part of the installation to earth must not be less in Megohms than 25 divided by the number of points as defined above. With all lamps and appliances removed from the circuits a similar test between poles may be demanded provided that during the rainy season half the above test value will be accepted. Where any appliance is a motor larger than one-half B.H.P. the insulation resistance of that particular circuit must be greater than one Megohm.

10. Joints and Looping Back :- No joints shall be allowed in conductors. Neutral shall be looped from point to point whereas the live wires shall be looped in the switch board only from switch to switch.

11. Switches :

- i) All main switches (Other than those of iron clad pattern) carrying over ten amperes shall be fitted for back connections.
- ii) All switches and circuit breakers shall be constructed in accordance with the I.E.E. wiring Rules, 8th edition No. 67, provided also that springs shall be either of phosphor bronze, or if of steel, shall be copper or nickel plated, and that handles shall be so fastened that they do not tend to unscrew or become loose (see also Clause 16).

12. Control at Point of Entry of Supply :- There shall be one main switch and one main fuse on which pole of each main circuit (Other than the neutral conductor of a 3 wire circuit) at the point of entry of the supply. The switches must be linked.

13. Distribution Boards :-

- i) Main distribution board shall be metal clad and shall be provided with a iron clad switch and fuse on each pole of the circuit.
- ii) Branch distribution board shall be provided with 1 fuse for each circuit and one common neutral bar. Maximum number of points to be wired on each circuit, shall be 6.
- iii) Switches and fuses of opposite polarity shall be mounted on separate bases with a shield of non-ignitable insulating material between the bases when placed and above the other.
- iv) In wiring a branch distribution board the total number of points shall be divided as far as possible evenly between the number of ways of the board. A spare circuit shall be left for future extensions.
- v) Fuses shall be of approved materials and each circuit shall be clearly numbered from left to right in conspicuous figures to correspond with the wiring plans.
- vi) Two spare fuse carriers per main and branch board shall be supplied for replacements
- vii) All boards (other than those of iron-clad pattern) shall have strongly made, well finished any approved teak cases with dovetailed corners and shall be polished and marked with conspicuous letters on labels to correspond with the wiring plans (Clause 4 (ii)).

- viii) Except in the case of 'Iron Clad' boards, cases shall have hinged or sliding plate glass doors with glass not less than one eighth of an inch in thickness and doors must be capable of being shut when any switch is either 'On' or 'Off'.

14. i) Passing through the Walls : Except as laid down in clause 87 where conductors pass the walls, one of the following alternative methods shall be used.

A hole of suitable area shall be made in the wall through which the casing or conductor shall be carried so as to allow of an air speed of not less than one inch on three sides of the casing or conductors as the case may be, or

The conductors shall be carried in an approved heavy gauge solid drawn or lap welded conduit tube or porcelain ducts. Where the supply is alternating current, the conductors of the circuit must be bunched.

- ii) Where a well tube passes outside a building so as to be exposed to the weather, the outer end shall be ball mouthed and turned downwards.

15. Plugging Walls : Plugs for ordinary walls or ceilings shall be of well seasoned teak or other approved hard wood, not less than two inches long by one inch square on the inner end and three-fourth inch square on the outer and except for use with metal sheathed wiring (see clause 54). They shall be cemented into the walls to within one-fourth inch of the surface and remainder being finished according to the nature of surface used, with plaster, or lime punning, and to give the cement, held on the plug there must be a bunch of two opposite sides two counter-bores not less than one-half inch by one-eighth inch deep, unless otherwise similarly specified. Brass screws may be used for attaching casing or battens to the plugs. Where owing to irregular coursing or other reasons the plugging of the walls or ceiling presents difficulties, the casing, battens or conduit (as the case may be) shall be attached to the wall or ceiling in a manner approved by the Corporation Engineer.

16. Branch switches (see clause 11) - In installations supplied from a three wire system, all branch switches shall be placed on the outer wires switches (other than those multiple control) controlling not more than 10 amperes shall be of the tumbler type and the switches shall be 'ON' when the handle or knob is down. Where the specified position of branch switches is altered, any such alterations of position after fixing will be paid for.

17. Coiling Rose and Wall sockets - Ceiling roses and wall sockets shall not contain fuse terminals. Wall sockets shall comply with the requirements of the British Engineering Standards Committee.

18. Fitting - where conductors are required to be threaded through tubes or channels formed in the metal work of fittings, these must be free from sharp angles or projecting edges and of such a size as will enable them to be wired with the conductors used for the final sub-circuits without removing the brading taping or outer covering. As far as possible, all tubes or channels should be of sufficient size to permit of 'looping back'. Where with the approval of the Corporation Engineer, 'Electrolite' wire is used for wiring fittings, the sub-circuit leads must terminate in a ceiling rose or connector from which this wire will be carried into the fittings. Flexible wire must not be used for wiring fittings, except portable fittings. All fittings must have not less than a half inch male nipple. Fittings and lamp holders for gas filled lamps shall be adequately ventilated.

19. Lamp holders - Lamp holders for use on brackets, etc. shall have not less than a half inch female nipple and all those for use with flexible pendants shall be provided with cord grips. All cases must be solid and substantial, thin case export type not being admissible. Edison screw holders will not be accepted for lamps below 100 watts.

20. External and Road Lamps — External and road lamps shall have weather proof fittings of approved design so as to effectually prevent the admission of moisture. An insulating distance piece of moisture proof material must be inserted between the lamp holder-nipple and that of the fitting. Flexible cord conductors and cord grip lamp holders must not be used where exposed to the weather. In verandahs and similar exposed situations rod pendants or ceiling plates shall be used.

21. Lamps.

- i) All glow lamps unless otherwise specified in the special conditions of contract shall be hung at height of nine feet above the floor level. Metal filament lamps shall be made of drawn wire only.
- ii) When carbon filament lamps are used, they shall comply with the Engineering Standard Committee's specification for carbon filament flow lamps.

22. Fans & Regulators.

- i)
 - a) All ceiling fans shall be suspended from a hook or shackle and insulated from the same. All joints in the suspension rod shall be screwed and all joints or bolts in connection there with shall be additionally secured by means of split pins.
 - b) The canopy and wood block at the top of the suspension rod shall effectually hide the suspension.
 - c) The leading in wire shall not smaller than 3/22 S.W.G. and shall be protected from being cut.
 - d) All fans shall be free from sparking, noise, oil throwing and excessive heating.
- ii)
 - a) All fans shall be hung nine and half feet above the floor or as directed by the Corporation Engineer.
 - b) All fans shall be capable of running at full speed for one month without additional oiling and shall not overheat after eight hours continuous run at full speed.
 - c) Each fan shall have a speed regulator which shall have a cover and an 'OFF' position and shall be designed as to be capable of reducing the normal speed of the fan by not less than 60 percent with all resistance in circuit. The regulator shall be capable of continuous use on any contact without burning or overheating.

23. Attachment of fittings and Accessories :

- i) In other than conduit wiring all ceiling roses, wall-sockets, regulators, brackets, pendants, and accessories attached to walls or ceiling shall be mounted on substantial teakwood blocks twice varnished after all fixing holes are made in them. Brass screws only are to be used for attaching fittings and accessories to their base blocks.
- ii) All attachment blocks shall have solid backs not less than one-eighth inch thick.

24. Interchangeability :-

Similar parts of all the switches, lamp-holders, distribution boards, ceiling roses brackets, pendants, fans and all other fittings of the same type shall be interchangeable.

LIFE INSURANCE CORPORATION OF INDIA

ANNEXURE I

Abstract of the Wiring Rules of the Institution of Electrical Engineers, referred to in the Specification.

DEFINITIONS

(See clause 2 of specification)

SYSTEM : An electrical system in which all the conductors and apparatus are electrically connected to a common source of supply.

- 12. **EARTHED :** Connected to the general mass of the earth in such a manner as will ensure at all times an immediate and safe discharge of electrical energy.
- 14. **Un-insulated Conductor :** A conductor without provision, by the interposition of a dielectric or otherwise, for its insulation from earth.
- 15. **Bare :** Not covered with insulated material.
- 16. **Dielectric :** Any material which offers high resistance to the passage of an electric current.
- 23. **Bunched Conductors :** When more than one conductor is contained within a single duct or groove, or when they are run unenclosed and not spaced apart from each other.
- 27. **PAINT :** In wiring. (Special definition in Clause 2 of this specification).
- 30. **SWITCHBOARD :** An assemblage of switches, fuses, conductors, measuring instruments and other apparatus for the control of the electrical machinery and circuits.
- 31. **SINGLE POLE SWITCH :** A switch controlling one conductor only or circuit.
- 34. **LINKED SWITCHES :** Switches linked together mechanically so as to operate simultaneously, or in definite sequences.
- 38. **FUSE-SWITCH :** A quick-break switch with fuse, forming an integral part of the switch.
- 41. **THREE WIRE SYSTEMS :** (A) Outer conductors – These between which there is the greatest difference of potential. This use of the word outer must not be confused with the use of the word when applied to the external conductor of concentric main, (B) Neutral Conductor – That which is at a potential intermediate between the potentials of the other conductors.

47. **SEMI – ENCLOSED MACHINE :** One in which the ventilating openings in the frame are covered with :
- (a) Grids, expanded metal or wire gauze, with openings of not less than $\frac{1}{4}$ inch so as not to obstruct free ventilation,
 - (b) Wire gauge, in which the openings are less than $\frac{1}{4}$ inch but not less than $\frac{3}{32}$ inch (diameter or width),
 - (c) Screens with smaller openings than the above.
48. **TOTALLY – ENCLOSED MACHINE :** One in which the enclosing case and bearings are dust-proof, and which does not allow circulation of air between the inside and outside of the
49. **PIPE – VENTILATED MACHINE :** An enclosed machine in which the frame is so arranged that the ventilating air may be conveyed to it through a pipe attached to the frame, the ventilation being maintained by the fanning action produced by the machine itself.
50. **FORCED – DRAUGHT MACHINE :** An enclosed machine in which the ventilating air supply is maintained by an independent fan external to the machine itself.
66. **PROTECTED MACHINE :** One having end shield bearings and in which there is free access to the interior without opening doors or removing covers.

SWITCHES AND CIRCUIT BREAKERS

(See Clause II of Specification)

67. **SWITCHES AND CIRCUIT BREAKERS :** Switches and Circuit breakers (rules 2b, 36 and 37) whether fixed separately or combined with lamps, holder or fittings, must comply with the following requirements :
- (a) Overheating must not take place at the point of contact or else where, when the full current flows continuously ;
 - (b) They must be so constructed or arranged that the contacts cannot accidentally close when left open ;
 - (c) They must be incapable of forming a permanent arc when breaking circuit, and they must be tested with pressures, and currents 50 percent in excess of those which will be used on the circuits for which they are intended ;
 - (d) The bases must be of incombustible, non-conducting and moisture-proof material ;
 - (e) Circuit-breakers must be so arranged and placed so that the combustible material is endangered by their action ;
 - (f) Unless placed in an engine room or in a compartment specially arranged for the purpose, they must have their live parts covered. The covers must be of incombustible material and must be either non-conducting or of rigid-metal and clear of all internal mechanism. For more than 6 amperes, at pressures exceeding 25 volts metal covers must be lined with insulating material.
 - (g) In positions where they are liable to injury or to come into contact with goods, they must be further protected by an open fronted box or other suitable guard ;

- (h) Handles must be insulated and so arranged that the hand cannot touch live metal, or be injured through an adjacent fuse blowing ;
- (i) Switches having a handle projecting through an open slot in the cover, must not be used.

COPPER CONDUCTORS

(See Clause 5 of Specifications)

71. A. Standards :

The data for the resistance of copper conductors are based on the standards defined by the Standards Committee as follows :

- (a) At a temperature of 20° the resistance of a wire of standard concealed copper one metre in length and of uniform cross-sectional area of one square millimeter is $1/58 \text{ ohm} = 0.017241 \text{ ohm}$;
- (b) The density of commercial annealed copper at 20°C. Is 8.89 grams per cubic centimeter;
- (c) A variation of 2 percent from the adopted standard of weight is allowed in all conductors;
- (d) An allowance of 1 percent increased resistance, as calculated from the diameter, is allowed in all tinned copper conductors between diameters 0.118 and 0.078 inch inclusive ;
- (e) For the purpose of calculation of tables, a lay, involving an increase of 2 percent, in each wire, except the centre wire, for the total length of the cable is taken as the standard ;
- (f) The legal standard wire gauge, as fixed by order in Council, dated August 23, 1882, is adopted as the standard for all wires.

FLEXIBLE CONDUCTOR

(See Clause 6 of Specification)

72. B. Size :

As per Tables III and IV (not reprinted).

77. A. VULCANISED RUBBER :

Vulcanized rubber flexible must be insulated with one layer of pure rubber and two layers of vulcanized rubber ; the minimum insulation resistance and radial thickness of the dielectric must be those specified in the British Standard Specification No. 7. The dielectric shall be suspended by a layer of tape and the whole shall be vulcanized together. In the case of cables having an outer protective covering of tough rubber (See regulation 83) the tape may be omitted.

79. B. SULPHUR :

Insulating material containing sulphur must not be in direct contact with copper wire (rule 41.).

84. **DIELECTRIC AND TESTS :** The insulating material used as the dielectric must be pure rubber equal to washed Para rubber or vulcanized rubber of the best quality. The pure rubber must be laid on the two layers, care being taken that the edges of each layer overlap, and the radial thickness of the dielectric must not be less than 20 mils. Each coil of pure rubber flexible must be tested, in air for 15 minutes with a pressure of 1,500 volts alternating between the conductors at a frequency of 50 to 100.

BUNCHING

(See Clause 28 of Specification)

90. **BUNCHING :** Where protected from mechanical injury by metal conduits or by a covering of tough rubber compound (rule 65) conductors of opposite polarity may be bunched. Where the protecting tubing or casing is non-metallic, lengths of conductors of the same polarity and free from joints carrying small currents for incandescent lighting, from sub-centres, as in rule 95 may be bunched. If the supply is alternating and the protection iron or steel, the lead and return conductors must be bunched.

CURRENT IN CIRCUITS AND SUB-CIRCUITS

(See Clause 13 of the Specifications)

95. **(Part only) :** For lighting purpose, in any final sub-circuit which supplies more than a single point, the current must not exceed 6 amperes for pressures up to 125 volts, not the power 600 watts from 125 to 250 volts and the maximum number of points on any sub-circuit must not exceed ten.

SPECIAL CONDITIONS & TECHNICAL SPECIFICATIONS FOR ELECTRICAL WORKS

SPECIAL CONDITIONS

1. SCOPE OF WORK

In general the work to be carried out under this contract shall be as specified in the specifications, detailed in the schedule of quantities, shown in the drawings and generally shall comprise of supply and installation of the following :-

- a. Wiring for lights, fan points, power outlets, special power wirings etc.
- b. D.B.'s, Main boards, floor boards.
- c. Mains, submains and power cables.
- d. Earthing.
- e. Lighting protection.
- f. Supply of fittings and fans.
- g. Erection of fittings and fans.

2. SPECIFICATION AND STANDARDS

Specifications applicable to this work shall be as per Indian Standard Specifications and specifications laid in National Electrical code unless otherwise specified in the description of items, given in the schedule of quantities or in the special conditions and/or Technical Specifications. Requirements or these specifications shall be fulfilled by the contractor within the tendered rates. Item rates quoted shall be deemed to have taken these specification into account.

3. In the interpretations of specifications or items where descriptions are conflicting or incomplete or otherwise subject to dispute, the following order of decreasing importance shall prevail.

1. Description of item in the schedule of quantities.
 2. Specifications attached to the tender.
 3. Indian Standard Specifications.
- Anything not covered by the above shall be as per I.E. Rules & Regulations.

4. ALTERATIONS

If any minor alterations are found necessary, the contractor will carry out the same with the prior approval of the Chief Engineer

5. WORKMAN – SHIP

The work will be carried out in the best workman like manner and any defect in the work or changes in the design etc., if pointed out, shall be carried out by the contractor within the tendered rates.

6. EMPLOYMENT OF SUPERVISORS/WORKERS.

The contractor shall employ adequate skilled and unskilled workmen to complete the work within the stipulated time and make his own arrangements for storage of materials etc. A whole time Electrical Engineer/Supervisor shall be deputed by the contractor who shall remain at site of work to receive orders or any other instructions from the Architects/Engineer-in-Charge.

7. MATERIAL SUPPLIED BY THE OWNER :

Any material supplied by the employers to contractor for erection, if damaged in any way during cartage or execution of work or otherwise, shall be made good by the contractor at his own cost.

8. CONTRACTOR'S RESPONSIBILITY.

During the progress of work, completed portions of the bldgs. may be occupied and put to use by the owner but contractor will remain fully responsible for maintenance of the electrical installation till the entire work covered by this contract is satisfactorily completed by him and taken over by the owner.

9. CONTRACTOR TO OBTAIN INFORMATION HIMSELF.

The contractor shall obtain for himself, on his own responsibility and at his own expenses all the information which may be necessary for the purpose of tendering and for entering into a contract, and must examine and study the specifications, inspect the site, the building and electrical plans etc. The contractor shall also not withstanding any information given to him, make local and independent enquiries.

10. Tender Rates.

All rates tendered will include for the cost of material, connections, labour, supervision, tools, plants, transport, all taxes, contingencies, breakage, wastage, sundries scaffolding and they should be for an item complete in all respects.

11. Approvals.

The contractor, while executing the work, shall conform to the provision on any Government Act relating to the work and to the regulations and Bye Laws of the local authorities, and of the company to whose system of supply the installation is proposed to be connected. The contractor shall give all notices, required by the acts, regulations or certificates and drawings as required and will make necessary arrangements to procure electricity supply without any extra charges. The contractor shall also obtain all approvals from appropriate authorities for the items of work done under this contract. All inspection fees or submission fees paid by the contractor will be reimbursed by the owner against valid official receipts. Contractor shall possess or shall employ a sub-contractor who possesses a valid Electrical Contractor's License issued by the inspectorate of the local government. The contractor shall file applications and follow up with electricity supply company for the sanction of power supply and commissioning of the electrical installations. preparation of drawings in consultation with the Architects (if any). Approval of drawings, and installation etc. shall be arranged by the contractor. All incidental charges/expenses associated with the above work shall be borne by the contractor.

12. Samples and Fabrication Drawings :

Samples of materials and fabrication drawings will be submitted by the contractor according to the schedule/specification. Any deviation from the schedule/ specification will have the written consent of the Executive Engineer Elect. However, approval given by the Executive Engineer Elect. To any samples or drawings submitted by the contractor shall in no way exonerate the contractor from his liability to carry out the work in accordance with the terms of the contract.

13. Working Drawings :

The contractor will submit four sets of working drawings indicating detailed layouts for approval at least two weeks in advance and proceed with work then after. All fabrications drawings and other literature will also be submitted in advance for approval. These drawings shall indicated conduit layout, location of DB's Meter Boards, Main Boards, cables, earthing and all other systems etc. as required for execution. Work at site shall commence only after the conduit layout drawings and all fabrication/work shop drawings have been approved.

14. Completion Drawings.

The contractor shall submit one complete set of Original Tracing and further two copies of layout drawings to the Executive Engineer after completion of the work. These complete drawings shall give the following information.

- a. Layout of Lighting and Power Wiring.
- b. Location of DB's, MB's, submains cables and earthing.
- c. Junction boxes, drawboxes and dummy conduits for telephones, fire alarm and other systems.
- d. Schematic diagram and shall indicate all systems that are covered in the scope of this work. No completion Certificate will be issued until the drawings in the above mentioned form are submitted. The drawings will be prepared and submitted by the contractor without extra charge.

15. Progress and time completion.

The work will commence immediately after the contractor receives instructions to proceed and will ensure that the work is completed within the stipulated period. Electrical work shall be carried out simultaneously with building and other works. The contractor will work in co-operation with the building contractor and other contractors and shall arrange to place the conduits in the masonry and concrete work as the building or other work proceed. Any hold up in the building or other works because of delay in laying of conduits or otherwise, shall be the responsibility of the Electrical contractor and will make him liable for damages, if any, by the Employers.

The contractor shall in consultation with the Executive Engineer Elect. Draw up a time schedule before commencement of the work. This time schedule will be strictly adhered to.

16. Defect Liability Period.

The completed installation shall not be finally taken over and acceptance certificate issued to the contractor until the expiry of defect liability period of one year. The contractor shall be liable for :

- a. The replacement of any defective parts that may develop in goods of his own manufacture or supplied by him.

- b. The rectification of all the defects arising out of defective workmanship of the contractor
- c. Bringing to the notice of Engineer-in-Charge any defect arising in materials supplied by the owner. The owner shall provide replacement of such material.
Until the installation is finally taken over, the contractor shall have the right of entry to the premises at his own risk and expenses for maintaining of the installation in proper order.

17. Painting and Marking.

All exposed steel work will be painted with one coat of primer and two coats of synthetic enamel paint in shades approved by the Engineer-in-Charge. This work will be done by the contractor without extra charge. All DB's, Main Boards, Meter Boards etc. shall be marked/number to indicate the area they control.

18. Conduits for various systems.

Separate and independent conduits will be laid for each systems such as lighting, power normal and essential DG set supply, telephones, TV etc. conduit less than 20mm in diameter shall not be used.

19. Inspection.

During production and prior to dispatch of equipment, contractor shall provide and secure every reasonable access and facility of inspection for Dy. Chief Engineer & his representative if so desired.

20. System of Wiring.

In any system of wiring no joints shall be made at intermediate points in the through run of cables unless the run of the final circuit, sub mains, mains etc. exceeds the length of standard coil as manufactured by the manufacturer of the cables.

21. Point Wiring.

In case of recessed conduit system, the point shall be completed with conduit including accessories and cables, necessary junctions outlets and switches, boxes, connector, wherever required necessary earthing, connections and ceiling rose.

a. The point shall commence from the distribution board including circuits each having independent neutral wires and shall end up to the outlet through control switch.

b. Installation shall be carried out in conformity with the ISI codes of practice, Indian Electricity Rules.

c. The convenience outlet socket points shall be completed with 2/3 pin socket enclosed in a sheet steel box with the controlling switch as required and third pin shall be earthed.

22. Junction and Pull Boxes.

Junction and Pull boxes of required sizes and ways shall be of sheet steel boxes.

23. Quantities.

Quantities indicated in the schedule are approximate and subject to wide variations.

24. Approved materials.

List of approved makes and manufacture of Electrical materials is attached. Only such materials as are on this list shall be allowed to be used. If contractor wishes to use any other materials not on the list, he must obtain permission of the Engineer-in-Charge in writing. He must furnish samples/literatures of items to Engineer-in-Charge in advance for approval. Materials to be used for particular item of work shall be of one brand throughout project and shall be ISI marked. Those materials for which ISI certificates are not issued, these shall have approval of Architects/owners in advance.

TECHNICAL SPECIFICATIONS**1. INTRODUCTION.**

The electrical installation shall be carried out in accordance with the specifications given hereunder and shall be in conformity with Indian Electricity Act 1910 as amended, Indian Electricity Rules 1956 as amended upto date relevant Indian Standard Code of Practice for electrical installations in Buildings, supplementary regulations of State Electricity Departments and electricity undertakings/Boards concerned, Delhi Electric Supply undertaking, Delhi Development Authority, Municipal Corpn. Of Delhi and any other concerned Authority. Where these specifications call for higher standards, these specifications shall be followed.

The general safety precautions as specified, in the IS code No. 5216/1969 "Code for safety procedures and practice in Electrical Works" shall be followed.

2. DEFINITIONS AND CONVENTIONAL SYMBOLS.

The definitions of terms shall be in accordance with Indian Standard Code of practice for electrical wiring installation IS 732/1963. The signs and symbols specified in IS Code 732/1963 shall be followed unless indicated otherwise in the drawings.

3. POINT WIRING.

Point wiring shall include all works necessary to complete the pint from distribution board upto outlet including circuit wire unless mentioned otherwise in the schedule of quantities, and shall include, conduit, outlet boxes, switch/push button, cover plate, wires, earth wire connectors etc.

4. SUB MAIN WIRING.

Sub Main wiring shall mean length of wiring from one main/distribution switch gear to another main/distribution switch gear measured along the run of wiring. Such wiring shall be measured on linear basis and will include conduit pipe with accessories, junction/draw/pull boxes with covers, wires etc. as detailed in the item. Measurements will be from end to end of conduit, exclusive of interconnections in the switch board etc.

5. SYSTEM OF WIRING.

Wiring shall be carried out in such a system as specified in the tender, schedule or otherwise in specifications. Power and heating wiring shall be kept separate and distinct from lighting and fan wiring. All conductors shall run as far as possible along the wall and ceiling so as to be easily accessible and capable of being thoroughly inspected. In no case open wiring shall be run above false ceiling. Due consideration shall be given for neatness, good appearance and safety.

6. CABLES.

All cables shall conform to relevant Indian Standards. Conductors of all cables shall be copper as indicated in the schedule. Smallest conductor to be used shall have nominal cross sectional area of not less than 1.0 sq.mm for light points and 4 sq.mm. for power points or as specified. Stranded conductor cables shall be used if so specified in the schedule of quantities.

7. JOINTS AND LOOPING BACK.

Wiring shall be done in the looping system. Phase or live conductors shall be looped at the switch box and neutral conductor can be looped outlet to outlet.

8. MARKING OF APPARATUS.

Switchgears shall be marked such as to indicate section of installation thus controls. All distribution boxes shall be marked lighting and power as the case may be and also marked with pressure and number of phase of supply. Each shall be provided with a circuit list giving details of circuit it controls.

9. COMPLETION TESTS.

On completion of installations the following test shall be carried out :

- a. Insulation resistance test.
- b. Polarity test of switch.
- c. Earth continuity Test.

a. INSULATION RESISTANCE TEST.

The insulation resistance shall be measured by applying between earth and the whole system of conductors or any section thereof with all fuses in place and all switches closed, and except in earthed concentric wiring all lamps in position or both poles of the installation otherwise electrically connected together, a direct current pressure of not less than twice the working pressure provided that it need not exceed 500 volts for medium voltage circuits. Where the supply is derived from the three wire D.C. or a Polyphase AC system, the neutral pole of which is connected to earth either direct or through added resistance the working pressure shall be deemed to be that which is maintained between the phase conductor and the neutral. The insulation resistance shall also be measured between all metallic (if used) conduits connected to one pole or phase conductor of the supply and all conductors connected to the Neutral or to the other pole or phase conductors of the supply with all lamps in position and switches in "OFF" position and its values shall be not less than that specified below. The insulation resistance is mega ohms measured as above shall not be less than 50 mega ohms divided by number of outlets.

A preliminary and similar test may be made before lamps etc. are installed in this event the insulation resistance to earth should not be less than 100 mega ohms divided by the number of outlets or when PVC insulated cables are used for wiring, 25 mega ohms divided by the number of outlets.

b. POLARITY TEST OF A SWITCH

i. In a two wire installation a test shall be made to verify that all switches in every circuit have been fitted in the same conductor throughout and such conductor shall be labeled or marked for connection to the non earthed conductor of the supply.

ii. In a three wire or four wire installation a test shall be made to verify that every non linked single pole switch is fitted in a conductor which is labeled or marked for connection to one of the phase conductor of the supply.

iii. The installation shall be connected to the supply for testing. The terminals of all switches shall be tested by a lamp, one lead of which is connected to earth. Glowing of test lamp to its full brilliance, when the switch is in "ON" position irrespective of appliance in position or not shall indicate that the switch is connected to the right polarity.

c. EARTH CONTINUITY TEST.

The earth continuity conductor including metal conduits and metallic envelops of cables in all cases shall be tested for electric continuity and the electrical resistance of the same along with the earthing lead but excluding any added resistance of earth leakage circuit breaker measured from the connection with the earth electrode to any point in the earth continuity conductor in the completed installation shall not exceed one ohm. The contractor shall notify in writing to the Architect/Engineer-in-Charge about the completion of the work. Within 30 days from the date of this notification, the Architects/Engineer-in-Charge may send their representative to remain present at the time of carrying out of the tests by the contractor if so desired. The Architects/Engineer-in-Charge for such tests.

Should the above tests not comply with the limits and requirements as above, the contractor shall rectify the faults until the required results are obtained.

The contractor shall be responsible for providing the necessary instruments and subsidiary earths for carrying out the tests. These tests shall be carried out by contractor without any extra charges.

10. BUNCHING OF CABLES

Cables carrying direct current, may if desired be bunched whatever their polarity, but cables carrying alternating current, if installed in metal conduit shall always be bunched so that the outgoing and return cables are drawn in the same conduit.

11. PAINTING OF ACCESSORIES.

After installation, all accessible surface of metal conduit pipes, fittings, switch and regulator boxes etc. shall be painted with one coat of primer and two coats of synthetic enamel paint.

12. OUTLETS/BOXES.

The switch or regulator box shall be made of metal on all sides, except on the front and shall be MS. materials. In case of welded mild steel sheet boxes the wall thickness shall not be less than 1.6mm for boxes. Except where otherwise stated 3mm thick phenolic laminated sheets shall be fixed on the front with brass screws. Clear depth of the box shall not be less than 60mm, and this shall be increased suitably as required. All fittings shall be fitted in flush pattern.

13. TYPE AND SIZE OF CONDUIT.

All conduit pipes shall be approved gauge (not less than 1.6mm thick sheet for conduits of size upto 32mm diameter and not less than 2mm thick sheet for conduits of size above 32mm diameter solid drawn or reamed by welding finished with stove enameled surface. All conduit accessories shall be threaded type and under no circumstances pin grip type or clamp grip type accessories shall be used. The maximum no. of VIR/PVC insulated 250 volt grade copper conductor cable that can be drawn in one conduit of various size shall be as given in table of CPWD specifications 1972 for internal Electrical works and the number of cables per conduit shall not be exceeded.

ERECTION OF CONDUIT.

The conduit of each circuit or section shall be completed before conductors are drawn in.

14. LAYING CONDUITS IN SLAB/FALSE CEILING.

Conduit shall be laid in the slab before casting and shall be adequately secured to the reinforcement to avoid displacement conduits when laid above false ceilings shall be properly fixed/secured with saddles. Wherever conduits are laid in the floor, these shall be properly embedded and covered with 1:8 cement and mortar.

15. MAKING OF CHASE.

The chase in the wall shall be neatly made and of ample dimensions and be 50mm deep to permit the conduit to be fixed in the manner desired. In the case of bldg. under construction, conduits shall be buried in the wall before plastering and shall be finished neatly after erection of conduit. In case of exposed brick/rubble masonry work, special care shall be taken to fix the conduit & accessories in position along with building work.

16. FIXING OF CONDUIT IN CHASE.

The conduit pipe shall be fixed by means of staples or by means of saddles not more than 60cm apart or by any other approved means of fixing. Fixing of standard bends shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with a long radius which will permit easy drawing in of conductors. At either side of bend, saddles/staples shall be fixed at a distance of 15cm on either side from the centre of the bend.

17. INSPECTION/DRAW/PULL BOXES.

Suitable MS inspection boxes to be barest minimum requirements shall be provided to permit periodical inspection and to facilitate replacement of wires, if necessary. These shall be mounted flush with the wall/ceiling and covered with 3mm thick egg white hylam cover plates. Suitable ventilating holes shall be provided in the inspection box covers if so directed.

18. LAYING OF CONDUITS IN FLOOR/FILLING.

Conduits laid in floor/filling shall be covered with 1:3 cement mortar to prevent damage/displacement.

19. TYPES OF ACCESSORIES TO BE USED.

All outlets such as switches, wall sockets etc. will be flush mounting type as specified in the specifications.

20. CONDUIT JOINTS.

Conduit pipes shall be joined by means of screwed couplers and screwed accessories only. In long distance straight run of conduit inspection boxes at reasonable intervals shall be provided. Threaded portion shall be treated with anti-corrosive preservative. Threads on conduit in all cases shall be between 13mm to 19mm long sufficient to accommodate pipes to full threaded portion of couplers or accessories. Cut ends of conduit pipes shall have no sharp edges nor any burrs left to avoid damage to the insulation of conductors while pulling them through such pipes. Conduit terminating in the switch boxes, distribution boards shall be secured with check nuts and PVC/nylon bushes installed at ends. The Engineer-in-Charge with a view to ensuring that the above provision has been carried out may require that the separate lengths of conduit etc. after they have been prepared shall be submitted for inspection before fixed.

21. PROTECTION OF CONDUIT AGAINST RUST.

The outer surface of conduit including all bends, union, tees, junction boxes, etc. forming part of the conduit system shall be adequately protected against rust where system is exposed to weather by being painted with two coats of oxide paint applied before they are fixed. In all cases, no bare threaded portion is treated with anti-corrosive preservative or covered with approved plastic compound.

22. SWITCH BOARDS (SHEET STEEL CUBICLE PATTERN)**i. CONSTRUCTION.**

Switch boards shall be sheet cubicle, indoor, floor wall mounting, free standing type. The design shall be totally enclosed, completely dust tight and vermin proof. The sheet steel used shall be 2mm thick gauge. Gaskets shall be used between adjacent units and beneath all covers to render the joints effectively dust proof.

A base channel of 50mm x 25mm fabricated out of 3mm thick rolled sheet steel, painted black shall be provided to prevent corrosion of the sheet steel cubicle and to facilitate cleaning of floors.

The switch boards be easily extensible, the arrangements shall be logical, compact and neat.

The switch board shall have uniform height through its length. Barriers shall be provided between the modules to accommodate equipment associated with outgoing circuits. All modules shall have a covering at the bottom so that entry of rats and vermin is not possible.

ii. FEEDER ARRANGEMENTS

The switch boards shall be of single front construction and equipment shall be mounted on the front only. Switch boards shall be of dead front type. All switches, push buttons etc. shall be operatable from the front. The rating of switches, fuses, contactors etc. shall be as specified. Out going feeders shall be neatly arranged in different compartments. Normally equipment for individual feeders shall be accommodated in separate modules.

The frame work shall house the switches, switch-fuse units, starters and contactors, MCBs and MCCBs etc. in multi tier formation. The equipment shall be mounted independent of the back plate and not on the rear surface of the housing. Each module shall be held securely against sponge rubber gaskets to make the equipment dust tight. All hinged doors shall be provided with insulated thumbdraws.

The compartment doors shall be so inter locked that it shall not be possible to open the door when the switch is in closed position.

iii. BUS BAR.

Three phase (and neutral) copper/aluminium bus bars shall be of the incoming switch current rating and shall be housed in separate bus bar chambers. Bus bars shall be supported on unbreakable non hygroscopic hylam supports rigidly held to the frame work of the chamber. Current density of bus bar shall not exceed 0.8 amps. Per mm² in case of aluminum. Bus bar chamber shall have colour-coding to identify the various phase of the bus bars.

iv. CABLE COMPARTMENT.

A cable compartment running along the vertical module shall be provided for easy termination of all incoming and outgoing cable entering either from top or bottom.

Adequate supports shall be provided for the cables where necessary. The cable compartment shall have its own screwed removable cover for easy access during cabling.

v. CONTROL WIRING.

All control wiring shall be carried out through the common vertical compartment. In case wires are required to cross the bus bar chamber such crossing shall be carried out in neat bunches. Control wiring shall be done by PVC insulated wires of minimum size 1.5 Sq.mm copper. All control wiring shall be fitted with identification ferrules at each end. Not more than two connections shall be made at any one terminal. The wires shall be arranged and supported in such a manner that there shall be no strain on terminations. The terminations shall be of adequate current rating and size to suit individual feeder arrangements. Power terminals shall be pressure clamp type suitable for copper/aluminium wires. For connections above 63A/35 Sq. mm cable lugs shall be used.

These cable lugs shall be mounted in such a manner as to facilitate cable connections.

vi. CABLE ENTRY.

Cubicles shall be designed to facilitate aluminium conductor PVC cable entry from top/or bottom as the case may be. Removable sheet plates shall be fitted at the top and bottom to drill holes for cable entry at site.

vii. PAINTING.

All steel works shall be painted in approved shade as required.

ERECTION OF BOARDS.**i. STORING.**

The panels shall be stored in a well ventilated, dry places, suitable polythene covers shall be provided for necessary protection against moisture.

ii. ERECTION.

Switch boards shall be installed on suitable foundation. Foundation shall be as per the dimensions supplied by the panel manufacturers. The foundation shall be flat and level. Suitable grouting holes shall be provided in the foundation. Suitable MS base channel shall be embedded in foundation on which the panel can be directly installed. The switch boards shall be properly sighted and bolted to the foundation.

iii. PRE COMMISSION TESTS.

Panels shall be commissioned only after the successful completion of the following test. The tests shall be carried out in the presence of Engineer-in-Charge.

- a. All main and auxiliary bus bar connections shall be checked and tightened.
- b. All wiring terminations and bus bar joints shall be checked and tightened.

- c. Wiring shall be checked to ensure that it all according to the drawing.
- d. All wiring shall be tested for insulation resistance by a 1000 volt megger.

24. EARTHING.

Earthing shall conform to the following specifications for other details not covered in this specification IS 30-1966 shall be referred to (Code of Practice for earthing).

PLATE EARTH ELECTRODE.

For plate electrodes minimum dimensions of the electrodes shall be as under :

- i. Copper plate electrodes 60cm x 60cm x 3mm thick. The electrode shall be buried in ground with its faces verticals and top not less than 3 m below ground level.

METHOD OF INSTALLING WATERING ARRANGEMENTS.

In the case of plate electrode, a watering pipe of 20mm dia of medium class GI pipe shall be provided and attached to the electrode. A funnel with mesh shall be provided on the top of this pipe for watering the earth. The watering funnel attachment shall be housed in masonry enclosure of not less than 30cm x 30cm x 30cm.

A cast iron / MS frame with cover having locking arrangement shall be suitably embedded in the masonry enclosure.

LOCATION OF EARTH ELECTRODE.

Normally an earth electrode shall be situated less than 1.5 m from any building. Care shall be taken that the excavations for earth electrode may not affect the column footings or foundations of the building in such cases electrodes may be further away from the building.

The location of the earth electrode will be such where the soil has reasonable chance of remaining moist, as far as possible entrances, pavements and roadways, are definitely avoided for locating the earth electrode.

METHOD OF CONNECTING EARTHING LEAD TO EARTH ELECTRODE.

In the case of plate earth electrode the earthing lead shall be securely bolted to the plate with two bolts, nuts, check nuts and washers.

All materials used for connecting the earth lead with electrode shall be tinned brass in cases of copper plated electrode.

The earthing lead shall be securely connected at the other end of the main board.

Loop earthing shall be provided for all mounting of main board and other metal switches and distribution fuse boards with not less than 14 SWG copper wire.

The earthing lead from electrode shall be suitably protected from mechanical injury by 15mm dia GI pipe in case of wire and 40mm dia medium GI pipe in case of strip, portions of this protection pipe within ground shall be buried at least 30cm deep (to be increased to 60cm in case of road crossing and pavement). The portion within the building shall be recessed in walls and floors to adequate depth.

In all cases the relevant provisions of Rule 33, 61 and 67 of Indian Electricity Rules 1956 as amended shall be complied with. Metallic covers or supports of all medium pressure or HT apparatus or conductors shall in all cases be connected to earth by not less than two separate and distinct earth electrodes. No earth electrode shall have greater ohmic resistance than one ohms as measures by an approved earth testing apparatus.

25. CABLE WORK, STORAGE AND HANDLING.

Cable drums shall be stored on a well drained, hard surface preferably of concrete, so that the drums do not sink in the ground causing rot and damage to the cable drums.

During storage periodical rolling drums once in 3 months through 90 degree shall be done especially in the case of paper insulated cables. Rolling shall be done in the directions of the arrow marker on the drum.

It should be ensured that both ends of the cable are properly sealed to prevent ingress/absorption of moisture by the insulation. Protection from rain and sun is preferable. Sufficient ventilation between cable drums, should be ensured during storage. The drums shall always be rested on flanges and not on flat sides. While removing cables the drums shall be properly mounted on jacks or on a cable wheel or any other suitable means making sure the spindle, back etc. is strong enough to take the weight of drum. The cables shall not be bent to a sharp to a small radius. The minimum safe bending radius for all types of PVC cables shall be taken as 12 times the overall diameter of the cable. Wherever practicable, larger radius should be adopted. At joints and terminations, the bending radius of individual cores of multi core cable shall not be less than 15 times its overall diameter.

Cable with links and straight ended links or with similar apparent defects like defective armoring etc. shall not be installed.

26. INSTALLATION.

The cable installation including necessary joints shall be carried out in accordance with the specifications given herein. For details not covered in the specifications, I.S. 1253-1967 shall be followed.

Before the cable laying is undertaken, the route of the cable shall be decided by the Engineer-in-Charge. While shortest practicable route should be preferred, cable runs shall generally follow fixed developments such as roads, foot paths, etc. with proper offsets so that future maintenance, identification etc. are rendered easy. Cables of different voltages and also power and control cables should be kept in different trenches with adequate separation, where available space is restricted. LV/MV cables shall be laid above HV cables. Where cables one another, the cable of higher voltage shall be laid at a lower level than the cable of lower voltage.

LAYING DIRECT IN GROUND.

A. Width of trench shall first be determined on the following basis :

i. The minimum width of trench for laying single cable shall be 35cm.

ii. Where more than one cable is to be laid in the same trench in horizontal formation, the width shall be increased such that the inter axial spacing between the cables, except where other specified shall be at least 20cm.

iii. There shall be a clearance of at least 15cm between axis of the cables and the sides of trench.

B. Depth of Trench:

The depth of trench shall be determined on the following basis :

- i. Where cables are laid in single tier formation, the total depth of trench shall not be less than 75cm for cables upto 1.1 KV and 1.2 m for cables above 1.1 KV.
- ii. When more than one tier of cables is unavoidable and vertical formation of laying is adopted, depth of trench in (i) above shall be increased by 30cm for each additional tier to be formed.

C. EXCAVATION OF TRENCHES :

The trenches be excavated in reasonably straight lines, wherever there is a change in direction suitable curvature shall be provided which shall be gradual. Excavation should be done by any suitable means – manual or mechanical. The excavated soil shall be stacked firmly by the side of the trench such that it may not fall back into the trench.

Existing properly exposed during trenching shall be temporarily supported or propped adequately as directed by the Engineer-in-Charge. The trenching in each cases shall be done in short length, necessary pipes laid for passing cables therein and the trench refilled.

If there is any danger of trench collapsing or endangering adjacent structure, the sides shall be well shored up with timbering and/or sheeting as excavation proceeds. Where necessary, these may even be left in place when back filling the trench. The bottom of the trench shall be in level and free from stone, brickbats etc. The trench shall then be provided with a layer of lean, dry sand cushion of not less than 8cm in depth.

D. LAYING OF CABLE IN TRENCH.

The cable drum shall be properly mounted on jacks or on a cable heel at a suitable location, making sure that the spindle is horizontal in the bearings so as to prevent the drum creeping to one side while rotating.

The cable shall be pulled over rollers in the trench steadily and uniformly without jerks and strains. The entire cable length shall as far as possible be payed off in one stretch. However, where this is not possible the remainder of the cable may be removed by 'Flanking' i.e., by making one long loop in the reverse direction.

For short runs and sizes upto 50 sq.mm of cables upto 1.1 KV grade, any other suitable method of direct handling and laying can be adopted with the prior approval of the Engineer-in-Charge. When the cable has been properly straightened, the cores are tested for continuity resistance and the cable is less then measured. The ends of all lead sheathed cables shall be sealed with solder immediately. In case of PVC cables, suitable moisture seal tape shall be used for this purpose.

Cable laid in trenches in a singly tier formation shall have a covering of clean and dry sand of not less than 17 cms., above the base cushion of sand before protective cover is laid.

In case of vertical multi-tier formation after the first cable has been laid a sand cushion of 30cm shall be provided over the initial bed before the second tier is laid. If additional tiers are formed, each of the subsequent tiers also shall have a sand cushion of 30 cms as stated above. The top most cable shall have a final sand covering not less than 17cms before the protective cover is laid. At the time of original installation, approximately 3m of surplus on each side of underground joints (Straight through/Tee/Termination and at entire and places as may be decided by the Engineer-in-Charge. The surplus cable shall be left in the form of loop. Where there are long runs of cable length, loose cables may be left at suitable intervals as specified by the Engineer-in-

Charge: Unless otherwise specified, the cables shall be protected by second class bricks of not less than 20cm x 10cm x 10cm (nominal-size) as per CPWD Building specification for protection covers placed on top of the sand (bricks to be laid widthwise for the full length of the cable to satisfaction of the Engineer-in-Charge. Where more than one cable is to be laid in the same trench, this protective covering shall cover all the cables and project at least 5cm over the side of the end cables.

BACK FILLING

The trenches then shall be backfilled with excavated earth free from stones or other sharp edged debris and shall be rammed and watered if necessary, in successive layers not exceeding 30cm. Unless otherwise specified, a crown earth not less than 50mm in the centre and tapering towards the side of the trench shall be left to allow for subsidence. The crown of earth however should not exceed 10cms so as not to be hazard to vehicular traffic. The temporary reinstatement of roadways should be inspected at regular intervals, particularly during the wet weather and any settlement should be made good by further fillings as may be required. After the subsidence has ceased, trenches cut through road ways or other paved areas shall be restored to the same density and material as the surrounding area and repaved in accordance with the relevant CPWD building specifications to the satisfaction of the Engineer-in-Chief.

Where road beams or lawns have been cut out or kerb stone displaced, the same shall be repaired and made good to the satisfaction of Engineer-in-Charge and all surplus earth rack removed to places as specified.

ROUTE MARKERS AND IDENTIFICATION TAGS.

Route markets shall be provided along straight runs of the cables at locations approved by the Engineer-in-Charge and generally at interval not exceeding 100 m. Markets shall also be provided to identify the change in the direction of the cable route and also for locations of every underground joint. Wherever more than one cable is laid/run side by side marker tags as approved inscribes with cable identification details shall be permanently attached to all the cables in the manhole put pits/joint pits/entry points in buildings/open ducts/Trays etc. These shall also be attached to various cables laid direct in ground at suitable intervals as decided by Engineer-in-Charge before the trenches are filled-up.

LAYING IN PIPES/CLOSED DUCTS:

In location such as road crossing entry to buildings, on poles, in paved areas etc. cables shall be laid in pipes or closed ducts. Stoneware pipes, GI, CI or spun reinforced concrete pipes shall be used for such purposes.

Pipes shall be continuous and clear of debris or concrete before cable is drawn. Sharp edges at ends shall be smoothened to prevent an injury to cable insulation or sheathing.

Pipes for cable entries to the building shall slope downwards from the building and suitable sealed to prevent entry of the water in the building. Further the mouth of the pipes at the building end shall be suitably sealed to avoid entry of water. Cable grips/draw wires and winches etc. may be employed for drawings cables through pipes/closed ducts etc.

LAYING OF SURFACE.

The cables may be laid in through trays or brackets at regular intervals or directly cleated to walls/ceiling. When laid over bracket supports the cables shall be clamped to prevent undue sag. Cable clamps shall be made from material such as mild steel, porcelain, wood, aluminium etc. In case of single core cable the clamps shall be non-magnetic material. A suitable non-corrosive packing shall be used for clamping unarmored cables, to prevent damage to the cable sheath.

JOINTING TERMINATION.

Jointing work shall be carried out only by a licensed/experienced cable joiner. Sufficient surplus ventilation shall be provided during jointing operation in order to disperse fumes given out by fluxing. Jointing materials and accessories like conductor ferrules, solder flux and protective tapes filling compound, jointing boxes etc. of right quality and correct sizes, conforming to relevant Indian Standards, wherever they exist shall be used. The design of the joint box and the composition of the filling compound shall be such as to provide an effective sealing against entry of moisture in addition to affording proper electrical characteristic to joints.

Where special type of splicing connector kits or epoxy resin spliced joints are specified, materials approved for such application shall be used and instructions of the manufacturer/supplier of such materials shall be strictly followed.

Insulation resistance of cables to be jointed shall be measure with 500 v megger upto 1.1 KV grade and with 2500/5000 V megger for cables of higher voltage. Unless the insulation resistance values are satisfactory, jointing shall not be done. Whenever aluminium conductor is exposed to outside atmosphere a highly tenacious oxide film is formed which makes soldering of aluminium conductor difficult. The oxide film should be removed using appropriate tape of flux.

CABLE TRAYS.

Cable trays shall be made of CRC sheet 1.8mm thick and of the sizes as specified in the schedule of quantities and marked on the drawings. Final routes shall be marked and ascertained at site in consultation with the Engineer-in-Charge. Installation of cable trays shall include all hard wares including suspension rods of 10mm MS rods. Each run of cable tray shall be rigid and be completed before cables are laid. Installation of cables trays shall be also include fixing by means of dash fasteners or by exposing of MS rods in the ceiling to support the tray in a rigid and perfect manner. Cutting of RCC/brick work, welding of suspension rods, repairing including supply of suspension rods etc. shall be deemed to have been included in the erection rates.

Bill of Quantities

(all rates and amount in Rs)

NAME OF WORK :- CONSTRUCTION OF OFFICER'S QUARTERS AT JAITARAN (RAJ.)					
CIVIL WORK:- SCHEDULE OF QUANTITIES					
NOTE: ALL RATES HAVE BEEN ANALYSED USING THE COST OF CEMENT AS RS.6,300/- PER MT and COST OF REINFORCEMENT STEEL AS RS.47,590/- PER MT					
S.No	Description of Item	Qty.	Unit	Rate	Amount
1	<u>EARTH WORK</u>	-			
1.01	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift up to 1.5 m, including getting out the excavated soil and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering, etc. and disposal of surplus excavated soil as directed, within a lead of 50 m.				
(a)	All kinds of soil. (from 0.00 mts to 1.50 mts.)	170	cum	157.50	26,775.00
(b)	All kinds of soil. (from 1.50 mts to 3.00 mts.)	25	cum	203.75	5,093.75
1.02	Excavating trenches of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, depth up to 1.5 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m :				
(a)	All kinds of soil				
(i)	Pipes, cables etc. not exceeding 80 mm dia.	50	metre	127.55	6,377.50
(ii)	Pipes, cables etc. exceeding 80 mm dia.but not exceeding 300 mm	70	metre	208.30	14,581.00
1.03	Supplying and filling in plinth with Local sand under floors, including watering, ramming, consolidating and dressing complete.	50	cum	910.25	45,512.50
1.04	Dry stone pitching 22.5 cm thick including Supply of stones and preparing surface complete.	490	sqm	422.80	2,07,172.00
	TRADE TOTAL				3,05,511.75

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
2	<u>CEMENT CONCRETE (PCC)</u>	-			
2.01	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level :				
(a)	1:4:8 (1 Cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)	10	cum	4301.15	43,011.50
(b)	1:5:10 (1 Cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size)	18	cum	4004.00	72,072.00
2.02	Providing and laying cement concrete in retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets, sunken floor, etc., up to floor five level , excluding the cost of centering, shuttering and finishing:				
(a)	1:2:4 (1 Cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	7	cum	6450.00	45,150.00
(b)	1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size)	25	cum	5818.00	1,45,450.00
2.03	Providing and laying damp-proof course 40 mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 12.5 mm nominal size).	16	sqm	257.80	4,124.80
2.04	Applying a coat of residual petroleum bitumen of grade of VG-10 of approved quality using 1.7 kg per square metre on damp proof course after cleaning the surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil.	16	sqm	132.00	2,112.00
2.05	Extra for providing and mixing water proofing material in cement concrete work in doses by weight of cement as per manufacturer's specification.	4	Kg	48.15	192.60
	TRADE TOTAL				286,857.60

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
3	<u>RCC WORK</u>	-			
3.01	Centering and shuttering including strutting, propping etc. and removal of form for :				
(a)	Foundations, footings, bases of columns, etc. for mass concrete	110	sqm	196.45	21,609.50
(b)	Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc.	25	sqm	360.80	9,020.00
(c)	Suspended floors, roofs, landings, balconies and access platform.	400	sqm	401.65	1,60,660.00
(d)	Shelves (Cast in situ)	35	sqm	401.65	14,057.75
(e)	Lintels, beams, plinth beams, girders, bressumers and cantilevers	455	sqm	332.15	1,51,128.25
(f)	Columns, Pillars, Piers, Abutments, Posts and Struts	210	sqm	453.35	95,203.50
(g)	Stairs, (excluding landings) except spiral-staircases	30	sqm	395.65	11,869.50
3.02	Providing and laying in position reinforced cement concrete work of grade 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size) for all works, excluding the cost of centering, shuttering, finishing and reinforcement				
(a)	All works up to plinth level	63	cum	6230.20	3,92,502.60
(b)	All works above plinth level up to floor V level	93	cum	7074.30	6,57,909.90
	TRADE TOTAL				1534518.25
4	<u>BRICK WORK</u>	-			
4.01	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in Cement mortar 1:6 (1 cement : 6 coarse sand) in all shapes and sizes				
(a)	All work in foundations and up to plinth level	50	cum	4677.25	2,33,862.50
(b)	All works in superstructure above plinth level up to floor V level	100	cum	5426.15	5,42,615.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
4.02	Half brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in Cement mortar 1:4 (1 cement : 4 coarse sand)				
(a)	All work in foundations and up to plinth level	10	sqm	584.75	5,847.50
(b)	All works in superstructure above plinth level up to floor V level	300	sqm	665.80	1,99,740.00
4.03	Extra for providing and placing in position 2 Nos. 6mm dia. M.S. bars at every third course of half brick masonry .	300	sqm	69.50	20,850.00
	TRADE TOTAL				10,02,915.00
5	<u>STEEL WORKS ; STEEL REINFORCEMENT</u>				
5.01	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete for all levels.				
(a)	Thermo-Mechanically Treated bars	15	MT	68,100.00	10,21,500.00
5.02	<u>STEEL WORKS</u> Providing and fixing 1mm thick M.S. sheet door with frame of 40x40x6 mm angle iron and 3 mm M.S. gusset plates at the junctions and corners, all necessary fittings complete, including applying a priming coat of approved steel primer. Using M.S. angles 40x40x6 mm for diagonal braces	5	sqm	3073.85	15,369.25
5.03	Providing and fixing circular/ Hexagonal cast iron or M.S. sheet box for ceiling fan clamp , of internal dia 140 mm, 73 mm height, top lid of 1.5 mm thick M.S. sheet with its top surface hacked for proper bonding, top lid shall be screwed into the cast iron/ M.S. sheet box by means of 3.3 mm dia round headed screws, one lock at the corners. Clamp shall be made of 12 mm dia M.S. bar bent to shape as per standard drawing.	17	each	142.95	2,430.15
5.04	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required.				
(a)	In gratings, frames, guard bar, ladder, railings, brackets, gates, grills and similar works	1615	kg	90.10	1,45,511.50

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
5.05a	Providing and fixing nickel plated M.S. pipe curtain rods with nickel plated brackets :	18	R.M.	126.60	2,278.80
5.05 b	Providing and fixing hand rail of M.S. tube approved size by welding etc. to steel ladder railing, balcony railing, staircase railing and similar works, including applying priming coat of approved steel primer.	115	Kg	104.70	12,040.50
5.06	Providing and fixing in position collapsible steel shutters with vertical channels 20x10x2 mm and braced with flat iron diagonals 20x5 mm size, with top and bottom rail of T-iron 40x40x6 mm, with 40 mm dia steel pulleys, complete with bolts, nuts, locking arrangement, stoppers, handles, including applying a priming coat of approved steel primer.	15	sqm	5291.30	79,369.50
	TRADE TOTAL				12,78,499.70
6	FLOORING WORK				
	<u>MARBLE AND GRANITE WORK</u>				
6.01	Mirror polishing on marble work/Granite work/stone work where ever required to give high gloss finish complete.	240	sqm	212.85	51,084.00
6.02	Providing edge moulding to 18 mm thick stone counters, Vanities, Staircase Treads etc., including machine polishing to edge to give high gloss finish etc. complete as per design approved by Engineer-in-Charge.				
(a)	Granite work	16	metre	230.55	3,688.80
(b)	Marble work	15	metre	136.10	2,041.50
6.03(a)	Providing and fixing Marble work gang saw cut (polished and machine cut) Raj Nagar Plain white marble/ Udaipur green marble/ Zebra black marble, of thickness 18 mm for kitchen plate form, vanity counter, window sills, facia and similar locations of required size approved shade, colour & texture laid over average 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), including joints treated with white cement mortar 1:2 (1 white cement : 2 marble dust) with an admixture of pigment to match the marble shade for area of slab up to 0.50 sqm	12	sqm	2341.50	28,098.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
6.03(b)	Providing and fixing 18 mm thick gang saw cut, mirror polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills, facias and similar locations of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels. Area of slab over 0.50 sqm. Granite of any colour and shade in toilet and kitchen platform	12	sqm	3907.40	46,888.80
6.04	Extra for providing opening of required size & shape for wash basin/ kitchen sink in kitchen platform, vanity counter and similar location in marble/Granite/stone work, including necessary holes for pillar taps etc. including moulding, rubbing and polishing of cut edges etc. complete.	6	Each	386.60	2,319.60
6.05	Extra for fixing marble /granite stone, over and above corresponding basic item, in facia and drops of width upto 150 mm with epoxy resin based adhesive, including cleaning etc. complete.	15	sqm	247.40	3,711.00
6.06	Providing and fixing Marble work gang saw cut (polished and machine cut) Raj Nagar Plain white marble/ Udaipur green marble/ Zebra black marble, of thickness 18 mm for Dado, Risers, skirtings , Pillars, wall lining (veneer work), backing filled with a grout of average 12 mm thick in cement mortar 1:3 (1 cement : 3 coarse sand), including pointing with white cement mortar 1:2 (1 white cement : 2 marble dust) with an admixture of pigment to match the marble shade (a) Area of slab upto 0.50 sqm	20	sqm	2782.65	55,653.00
	<u>SUB HEAD-XI :FLOORING WORKS</u>				
6.07	Providing & fixing Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including rubbing and polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand)	-			

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(a)	25 mm thick	60	sqm	1141.40	68,484.00
6.08	Providing & fixing Kota stone slabs 20 mm thick in risers of steps, skirting, dado and pillars laid on 12 mm (average) thick cement mortar 1:3 (1 cement: 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and polishing complete.	16	sqm	1191.25	19,060.00
6.09	Extra for pre finished nosing to treads of steps of kota stone.	48	metre	75.80	3,638.40
6.10	Extra for kota stone flooring in treads of steps and risers using single length up to 2.00 metre .	10	sqm	16.90	169.00
6.11	Providing & fixing Marble stone flooring with 18 mm thick marble stone, as per sample of marble approved by Engineer-in-charge, over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with grey cement slurry, including rubbing and polishing complete with				
(a)	Rajnagar Plain	240	sqm	1757.60	4,21,824.00
(b)	Udaipur Green marble	27	sqm	1757.60	47,455.20
6.12	Providing and Laying Premium quality ceramic glazed wall tiles of size 12"x18" conforming to IS: 15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades except burgundy, bottle green, black as approved by Engineer-in-Charge, in skirting, risers of steps and dados , over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.	100	sqm	836.65	83,665.00
6.13	Providing and laying rectified Glazed Ceramic floor tiles of size 300x300 mm or more (thickness to be specified by the manufacturer), of 1st quality conforming to IS : 15622, of approved make, in all colours, shades, except White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick Cement Mortar 1:4 (1 Cement : 4 Coarse sand), including pointing the joints with white cement and matching pigments etc., complete.	24	sqm	1009.60	24,230.40

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
7	FINISHING				
7.01	Providing & applying 12 mm cement plaster of mix : Internal work on walls				
(a)	1:4 (1 cement: 4 coarse sand)	810	sqm	172.30	1,39,563.00
7.02	Providing & applying 6 mm cement plaster of mix : Internal work on Ceiling/ RCC Work				
(a)	1:3 (1 cement : 3 fine sand)	400	sqm	134.70	53,880.00
7.03	Providing & applying 18 mm thk. External cement plaster in two coats under layer 12 mm thick cement plaster 1:5 (1 cement: 5 coarse sand) and a top layer 6 mm thick cement plaster 1:3 (1 cement : 3 coarse sand) finished rough with sponge.	700	sqm	258.90	1,81,230.00
7.04	Extra for providing and mixing water proofing material in cement plaster work in proportion recommended by the manufacturers.	180	Kg	50.65	9,117.00
7.05	Distempering with oil bound washable distemper of approved brand and manufacture to give an even shade :				
7.06	New work (two or more coats) over and including water thinnable priming coat with cement primer Finishing walls with textured exterior paint of required shade :	1210	sqm	89.70	1,08,537.00
(a)	New work (Two or more coats applied @ 3.28 ltr/10 sqm) over and including priming coat of exterior primer applied @ 2.20kg/10 sqm	700	sqm	146.45	1,02,515.00
7.07	Finishing walls with water proofing cement exterior paint of required shade :				
(a)	New work (Two or more coats applied @ 3.84kg/10 sqm)	50	sqm	57.85	2,892.50
7.09	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	800	sqm	89.65	71,720.00
7.10	Painting with synthetic enamel paint , having VOC (Volatile Organic Compound) content less than 150 grams/ litre, of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour.				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(a)	Two coats	150	sqm	71.60	10,740.00
7.11	Applying one or more coats of primers				
(a)	With ready mixed pink or Grey primer of approved brand and manufacture on wood work (hard and soft wood)	250	sqm	32.95	8,237.50
(b)	With ready mixed red oxide zinc chromate primer of approved brand and manufacture on steel galvanised iron/ steel works	150	sqm	27.00	4,050.00
7.12	Neat cement punning.	20.00	sqm	41.4	828.00
7.13	Add for plaster drip course/ groove in plastered surface or moulding to R.C.C. projections.	200.00	metre	30.75	6,150.00
	TOTAL				6,99,460.00
8	<u>SUB HEAD-IX :WOOD AND PVC WORK</u>				
8.01	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position with hold fast lugs or with dash fasteners of required dia & length (hold fast lugs or dash fasteners shall be paid for separately)				
(a)	Sal wood	2.5	Cum	75558.60	1,88,896.50
8.02	Providing and fixing ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type , core of block board construction with frame of 1st class hard wood and well matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
a	25 mm thick (for cupboard) including ISI marked nickel plated bright finished M.S. piano hinges with necessary screws	20	sqm	2109.00	42,180.00
8.03	Providing and fixing ISI marked flush door shutters conforming to IS :2202 (Part I) non-decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters:				
a	30 mm thick including ISI marked Stainless Steel butt hinges with necessary screws	50	sqm	1735.35	86,767.50
8.04	Extra for Providing and fixing flush doors with decorative veneering instead of non decorative ISI marked flush door shutters conforming to IS: 2202 (Part 1)				
	On one side only	20	sqm	394.90	7,898.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
8.05	Extra for providing lipping with 2nd class teak wood battens 25 mm minimum depth on all edges of flush door shutters (over all area of door shutter to be measured).	70	sqm	365.85	25,609.50
8.06	P/F Teak wood beading 19x6 mm	155	RM	75.00	11,625.00
8.07	Providing 40x5 mm flat iron hold fast 40 cm long including fixing to frame with 10 mm diameter bolts, nuts and wooden plugs and embedding in cement concrete block 30x10x15cm 1:3:6 mix (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size)	50	each	117.35	5,867.50
8.08	Extra for providing frosted glass panes 4 mm thick instead of ordinary float glass panes 4 mm thick in doors, windows and clerestory window shutters. (Area of opening for glass panes excluding portion inside rebate shall be measured).	10	sqm	5.80	58.00
8.09	Prime cost for hardware fittings	LS			55000.00
8.10	Contractor's percentage 25%	55000.00		25.00%	13750.00
8.11(a)	Providing and fixing second class teak woodwire gauge shutters using galvanized M.S. wire gauge of average width of aperture 1.4 mm in both directions with wire of dia, 0.63 mm, for doors, windows and clerestory windows with hinges and necessary screws :35 mm thick shutters with frame of 100mm style, 100mm top rail, 150mm lock rail and 200mm bottom rail for door shutters with ISI marked MS pressed butt hinges finishes with primer and synthetic enamel painting necessary teak wood beading complete.	18.00	Sqm	3063.05	55134.90
8.11(b)	Providing and fixing second class teak wood wire gauge shutters using galvanized M.S. wire gauge of average width of aperture 1.4 mm in both directions with wire of dia, 0.63 mm, for doors, windows and clerestory windows with hinges and necessary screws ,30 mm thick shutters with frame of 75mm style,top and bottom rail forwindows shutters with ISI marked MS pressed butt hinges finishes with primer and synthetic enamel painting ,necessary teak wood beading complete	36.00	Sqm	2709.25	97533.00
8.12	Providing and fixing second class teak wood glazed shutters for doors, windows and clerestory windows using 4 mm thick float	36.00	SQ MT	2939.75	105831.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
8.13	glass panes, including ISI marked M.S.pressed butt hinges bright finished of required size with necessary screws.30 mm thick shutters with frame of 75mm style,top and bottom rail for windows shutters with ISI marked MS pressed butt hinges finishes with primer and synthetic enamel painting ,necessary teak wood beading complete. Providing and fixing Pre-laminated flat pressed 3 layer (medium density) particle board or graded wood particle board IS : 3087 marked, with one side decorative and other side balancing lamination Grade I, Type II exterior grade IS : 12823 marked, in shelves with screws and fittings wherever required, edges to be painted with polyurethane primer (fittings to be paid separately). 18 mm thick	15.00	sqm	1202.00	18030.00
8.14	Providing and fixing 18 mm thick, 150 mm wide pelmet of flat pressed 3 layer or graded wood particle board medium density grade I, IS : 3087 marked, including top cover of 6 mm commercial ply wood conforming to IS: 303 BWR grade, nickel plated M.S. pipe 20 mm dia (heavy type) curtain rod with nickel plated brackets, including fixing with 25x3 mm M.S. flat 10 cm long fixed to pelmet with hollock wood cleats of size 100 mm x 40 mm x 40 mm on both inner side of pelmet and rawl plugs 75 mm long etc. all complete.	50.00	RM	372.75	18637.50
8.15	Extra for using veneered particle board conforming to IS 3097 Grade I, in item of pelmet 18mm thick 150mm wide. Particle board with decorative veneering on both sides	50.00	RM	92.9	4645.00
8.16	Providing and fixing teak wood lipping of size 25x3 mm in pelmet.	100.00	RM	49	4900.00
8.17	Melamine polishing on wood work (one or more coat).	25.00	sqm	76.7	1917.50
8.18	Providing and fixing flat pressed 3 layer particle board medium density exterior grade (Grade I) or graded wood particle board IS : 3087 marked, to frame, backing or studding with screws etc. complete (Frames, backing or studding to be paid separately) : 12 mm thick	25.00	sqm	528.6	13215.00
8.19	Providing & Fixing decorative high pressure laminated sheet of plain /wood grain in gloss/	50.00	sqm	676.4	33820.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
	matt / suede finish with high density protective surface layer and reverse side of adhesive bonding quality conforming to IS :2046 Type S, including cost of adhesive of approved quality.1.0 mm thick				
	TRADE TOTAL				7,91,315.90
9	ROAD WORK				
9.01	Filling with earth brought from outside in plot, plinth, foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering etc.	165	cum	320.90	52948.50
9.02	Preparation and consolidation of sub grade with power road roller of 8 to 12 tonne capacity after excavating earth to an average of 22.5 cm depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade and disposal of surplus earth with lead upto 50 metres.	1100	Sqm	81.29	89,419.00
9.03	Providing and laying C.C. pavement of mix 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate) be laid to required slope and camber in pannels as required including consolidation finished with screed board vibrator, vacuum dewatering process and finally finished by floating, brooming with wire brush etc. complete as per specifications and direction of Engineer-in-charge.(The panel shuttering work shall be paid for separately).	20	cum	5450.45	1,09,009.00
9.04	Providing and laying factory made chamfered edge Cement Concrete paver blocks of (M-30) required strength, thickness & size/shape, made by table vibratory method using PU mould, laid in required colour & pattern over 50mm thick compacted bed of fine sand, compacting and proper embedding/laying of inter locking paver blocks into the sand bedding layer through vibratory compaction by using plate vibrator, filling the joints with jamuna sand and cutting of paver blocks as per required size and pattern, finishing and sweeping extra sand in footpath, parks, lawns, drive ways or light traffic parking etc. complete as per manufacturer's specifications & direction of Engineer-in-Charge. 60mm thick C.C. paver block of M-30 grade with approved design & pattern	172	Sqm	602.2	1,03,578.40

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
9.05	Providing and laying at or near ground level factory made kerb stone of M-25 grade cement concrete in position to the required line, level and curvature, jointed with cement mortar 1:3 (1 cement : 3 coarse sand), including making joints with or without grooves (thickness of joints except at sharp curve shall not to more than 5mm), including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge (length of finished kerb edging shall be measured for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-Charge)	5	cum	5295.90	26,479.50
	TOTAL				3,81,434.40
10	WATERPROOFING WORK				
10.01	Providing and laying water proofing treatment in sunken portion of WCs , bathroom etc., by applying cement slurry mixed with water proofing cement compound consisting of applying : a) First layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @ 0.253 kg/sqm. This layer will be allowed to air cure for 4 hours. b) Second layer of slurry of cement @ 0.242 kg/sqm mixed with water proofing cement compound @ 0.126 kg/sqm. This layer will be allowed to air cure for 4 hours followed with water curing for 48 hours. The rate includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes and masonry with polymer mixed slurry.	55	sqm	283.10	15,570.50
10.02	Providing and laying cement concrete in sunken floor etc., up to floor five level , excluding the cost of centering, shuttering and finishing:1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size)	10	cum	5656.20	56,562.00
10.03	Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs , balconies, terraces etc consisting of following operations: a) Applying a slurry coat of neat cement using 2.75 kg/sqm of cement admixed with water proofing compound conforming to IS. 2645 and approved by Engineer-in-charge over the RCC slab including adjoining walls upto 300	240	sqm	1019.05	2,44,572.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
	mm height including cleaning the surface before treatment. b) Laying brick bats with mortar using broken bricks/brick bats 25 mm to 115 mm size with 50% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge over 20 mm thick layer of cement mortar of mix 1:5 (1 cement :5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of junctions of walls and slabs.				
	c) After two days of proper curing applying a second coat of cement slurry using 2.75 kg/ sqm of cement admixed jointless cement mortar of mix 1:4 (1 cement :4 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge including laying glass fibre cloth of approved quality in top layer of plaster and finally finishing the surface with trowel with neat cement slurry and making pattern of 300x300 mm square 3 mm deep. e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Engineer-in-Charge with average thickness of 120 mm and minimum thickness at khurra as 65 mm.				
	TOTAL				3,16,704.50
11 11.01	SANITARY INSTALLATION Providing and fixing water closet squatting pan (Indian type W.C. pan) with 100mm sand cast iron P or S trap, 10 litre low level white P.V.C. flushing cistern , including flush pipe, with manually controlled device (handle lever) conforming to IS : 7231, with all fittings and fixtures complete, including cutting and making good the walls and floors wherever required :				
	White Vitreous china Orissa pattern W.C. pan of size 580x440mm with integral type foot rests.	3	each	3,392.80	10,178.40

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
11.02	Providing and fixing white vitreous china pedestal type water closet (European type W.C. pan) with seat and lid, 10 litre low level white P.V.C. flushing cistern, including flush pipe, with manually controlled device (handle lever), conforming to IS : 7231, with all fittings and fixtures complete, including cutting and making good the walls and floors wherever required:				
(a)	W.C. pan with ISI marked white solid plastic seat cover and lid.	3	each	3,317.30	9,951.90
11.03	Providing and fixing wash basin with C.I. brackets, 15 mm C.P. brass pillar taps, 32 mm C.P. brass waste of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever require:				
(a)					
	White Vitreous China Flat back wash basin size 550x 400 mm with single 15 mm C.P. brass pillar tap	9	each	1807.10	16,263.90
11.03	Providing and fixing stainless steel kitchen sink A ISI 304(18/8) as per IS 13983 with C.I. brackets and SS plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required : Kitchen sink with drain board and size 510x1040mm bowl depth 250mm	3	each	7052.15	21,156.45
(b)					
11.04	Providing and fixing P.V.C. waste pipe for sink or wash basin including P.V.C. waste fittings complete.				
	Flexible pipe				
(a)	32 mm dia	9	each	74.45	670.05
(b)	40 mm dia	3	each	79.75	239.25
11.05	Providing and fixing 600x450 mm beveled edge mirror of superior glass (of approved quality) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete.	9	each	793.95	7,145.55
(a)					
(b)	shelf with edges round off, supported on anodised aluminium angle frame with C.P. brass brackets and guard rail complete fixed with 40 mm long screws, rawl plugs etc., complete.	9	each	543.80	4,894.20
11.06	Providing and fixing CP brass bib cock short body as per approved quality conforming to IS 8931.: 15 mm nominal bore	12	each	459.50	5,514.00
(a)					

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(b)	CP brass long body	12	each	610.65	7,327.80
(c)	CP brass stop cock	18	each	619.75	11,155.50
(d)	CP Shower rose with 15 mm inlet	6	each	86.35	518.10
(e)	C.P brass toilet Paper holder	3	each	415.90	1,247.70
11.07	Providing and fixing CP brass angle valve for basin mixer and geyser points of approved quality conforming to IS: 8931 : 15mm nominal bore	30	each	507.70	15,231.00
11.08	Providing and fixing unplasticised PVC connection pipe with brass unions : 45 cm length 15 mm nominal bore	36	each	68.60	2,469.60
11.09	Providing and fixing soil, waste and vent pipes :				
(a)	100 mm dia. Centrifugally cast (spun) iron socketed & spigot (S&S) pipe as per IS: 3989.	25	metre	917.75	22,943.75
(b)	75 mm dia. Centrifugally cast (spun) iron socketed & spigot (S&S) pipe as per IS: 3989.	60	metre	791.30	47,478.00
11.10	Providing and fixing M.S. holder-bat clamps of approved design to Sand Cast iron/cast iron (spun) pipe embedded in and including cement concrete blocks 10x10x10cm of 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) including cost of cutting holes and making good the walls etc. :				
(a)	For 100 mm dia. Pipe	15	each	152.90	2,293.50
(b)	For 75 mm dia. Pipe	30	each	150.60	4,518.00
11.11	Providing and fixing bend of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.				
(a)	100 mm Sand cast iron S&S as per IS - 3989	6	each	385.70	2,314.20
(b)	75 mm Sand cast iron S&S as per IS – 3989	8	each	318.50	2,548.00
11.12	Providing and fixing heel rest sanitary bend				
(a)	100 mm Sand cast iron S&S as per IS – 3989	2	each	371.75	743.50
11.13	Providing and fixing single equal plain junction of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.				
(a)	100x100x100mm Sand cast iron S&S as per IS - 3989	6	each	623.80	3,742.80
(b)	75x75x75mm Sand cast iron S&S as per IS - 3989	8	each	472.95	3,783.60
11.14	Providing and fixing terminal guard:				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(a)	100 mm Sand cast iron S&S as per IS 3989	2	each	434.50	869.00
(b)	75 mm Sand cast iron S&S as per IS 3989	2	each	370.75	741.50
11.15	Providing and fixing collar :				
(a)	100 mm Sand cast iron S&S as per IS 3989	8	each	318.35	2,546.80
(b)	75 mm Sand cast iron S&S as per IS 3989	8	each	219.75	1,758.00
11.16	Providing lead caulked joints to sand cast iron/centrifugally cast (spun) iron pipes and fittings of diameter:				
(a)	100 mm	15	each	243.75	3,656.25
(b)	75 mm	32	each	205.30	6,569.60
11.17	Providing and fixing M.S. stays and clamps for sand cast iron/centrifugally cast (spun) iron pipes of diameter :				
(a)	100 mm	14	each	68.60	960.40
(b)	75 mm	14	each	57.15	800.10
11.18	Providing and fixing trap of self cleansing design with screwed down or hinged grating with or without vent arm complete, including cost of cutting and making good the walls and floors :				
(a)	100 mm inlet and 100 mm outlet Sand cast iron S&S as per IS: 3989.	3	each	982.55	2,947.65
(b)	100 mm inlet and 75 mm outlet Sand cast iron S&S as per IS: 3989.	27	each	1,020.90	27,564.30
11.19	Providing and fixing on wall face unplasticised rigid PVC rain water pipes conforming to IS: 13592 Type A, including jointing with seal ring confirming to IS : 5382, leaving 10mm gap for thermal expansion.				
a)	Single socked pipe 75 mm diameter	10	metre	145.70	1,457.00
b)	Single socked pipe 110 mm diameter	50	metre	231.65	11,582.50
11.20	Providing and fixing on wall face unplasticised - PVC moulded fittings / accessories for unplasticised rigid PVC rain water pipe confirmint to IS: 13592 Type A, including jointing with seal ring confirming to IS : 5382, leaving 10mm gap for thermal expansion.				
(A) (i)	75 mm Coupler	2	each	108.65	217.30
(A) (ii)	110 mm Coupler	7	each	138.30	968.10
(B) (i)	75 mm Bend 87.5	2	each	113.25	226.50

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(B) (ii)	110 mm Bend 87.5	7	each	161.55	1,130.85
(C) (i)	75 mm Shoe (Plain)	2	each	167.85	335.70
(C) (ii) 11.21	110 mm Shoe (Plain) Providing and fixing unplasticised-PVC clips of aproved design to unplasticised - PVC rain water pipes by means of 50x50x50mm hard wood plug, screwed with MS Screws of required length, including cutting brick work and fixing in cement mortor 1:4 (1 cement : 4 coarse sand) and making good the walls etc. complete.	7	each	295.10	2,065.70
a)	75 mm	8	each	189.05	1,512.40
b)	110 mm	30	each	189.05	5,671.50
11.22	Providing and fixing of the inlet of rain water pipe cast iron grating of 15 cm diameter & weighing not less than 440 gms	8	each	41.10	328.80
	TRADE TOTAL				283112.20
12.01	<u>WATER SUPPLY</u> Providing and fixing chlorinated polyvinyl Chloride (CPVC) pipes, having thermal stability for hot and cold water supply, including all CPVC plain & brass threaded fittings, fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and cost of cutting chases and making good the same including testing of joints. complete as per direction of Engineer in charge.				
(a)	Concealed Internal work , including cutting chases and making good the walls etc				
(i)	15 mm nominal outer dia pipes	30	metre	270.00	8,100.00
(ii)	20 mm nominal outer dia pipes	45	metre	296.40	13,338.00
(iii)	25 mm nominal outer dia pipes	5	metre	351.30	1,756.50
12.02	Providing and fixing G.I. pipes complete with G.I. fittings and clamps, including cutting and making good the walls etc.				
(a)	Internal work – Exposed on wall				
(i)	15 mm dia. nominal bore	35	metre	215.10	7,528.50
(ii)	20 mm dia. nominal bore	40	metre	249.30	9,972.00
(iii)	25 mm dia. nominal bore	25	metre	304.15	7,603.75
(iv)	32 mm dia. nominal bore	25	metre	343.20	8,580.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(v) 12.03	40 mm dia. nominal bore Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc.	10	metre	425.65	4,256.50
(a)	External work				
(i)	15 mm dia. nominal bore	15	metre	186.25	2,793.75
(ii)	20 mm dia. nominal bore	5	metre	209.95	1,049.75
(iii)	25 mm dia. nominal bore	20	metre	257.30	5,146.00
(iv)	32 mm dia. nominal bore	65	metre	281.05	18,268.25
12.04	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) :				
(i)	25 mm nominal bore.	6	each	428.85	2,573.10
(ii)	32 mm nominal bore.	6	each	501.50	3,009.00
12.05	Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete :				
	25 mm nominal bore	3	each	449.95	1,349.85
12.06	Providing and fixing gun metal non- return valve of approved quality (screwed end) :				
(i)	32 mm nominal bore Horizontal	2	each	553.30	1,106.60
(ii)	33 mm nominal bore Vertical	1	each	634.60	634.60
12.07 (A)	Providing and fixing brass ferrule with C.I. mouth cover including boring and taping the main				
(i)	15 mm nominal bore	1	each	245.95	245.95
12.07 (B)	Providing and fixing water meter with C.I. stop cock in G.I. pipe line including cuttinf and treading the pipe and making goo long screw etc. complete (cost of water meter and stop cock to be paid seperately)				
(i)	15 mm nominal bore	3	each	315.50	946.50
12.08	Constructing masonry Chamber 30x30x50 cm inside , in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for stop cock , with C.I. surface box 100x100x75 mm (inside) with hinged cover fixed in cement concrete slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), i/c necessary excavation , foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand)				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
	12mm thick, finished with a floating coat of neat cement complete as per standard design:				
(a)	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	1	each	1,157.75	1,157.75
12.09	Constructing masonry Chamber 60x45x50 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for water meter complete with C.I. double flap surface box 400x200x200 mm (inside) with locking arrangement and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) , i/c necessary excavation , foundation concrete 1:5:10 (1 cement : 5 fine sand:10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design : With common burnt clay F.P.S.(non modular) bricks of class designation 7.5	1	each	6,039.95	6,039.95
12.10	Painting G.I. pipes and fittings with synthetic enamel white paint with two coat over a ready mixed priming coat, both of approved quality for new work :				
(a)	15 mm diameter pipe.	35	metre	9.60	336.00
(b)	20 mm diameter pipe.	40	metre	11.35	454.00
(c)	25mm diameter pipe.	25	metre	14.95	373.75
(d)	32 mm diameter pipe.	25	metre	17.70	442.50
(e)	40 mm diameter pipe.	10	metre	21.00	210.00
12.11	Painting C.I. pipes and fittings with two coats of anticorrosive bitumastic paint of approved quality :				
(a)	75 mm diameter pipe.	40	metre	24.75	990.00
(b)	100 mm diameter pipe.	40	metre	38.65	1,546.00
(c)	150 mm diameter pipe.	60	metre	57.60	3,456.00
12.12	Providing and placing on terrace (at all floor levels) polyethylene water storage tank , ISI: 12701 marked, with cover and suitable locking locking arrangement and making necessary holes for inlet, outlet and overflow pipe but without fittings and the base support for tank.				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(a)	For OQ - 3X1000	3000	Litre	7.25	21,750.00
12.13	Cutting holes up to 30x30 cm in walls including making good the same: With common burnt clay F.P.S. (non modular) bricks	3	each	207.95	623.85
12.14	Cutting holes up to 15x15 cm in R.C.C. floors and roofs for passing drain pipe etc. and repairing the hole after insertion of drain pipe etc. with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), including finishing complete so as to make it leak proof.	15	each	193.00	2,895.00
12.15	Making chases up to 7.5x7.5 cm in walls including making good and finishing with matching surface after housing G.I. pipe etc.	50	metre	85.70	4,285.00
12.16	Providing and fixing G.I. Union in G.I. pipe including cutting and threading the pipe and making long screws etc. complete (New work):				0.00
(a)	15 mm nominal bore	10	each	165.25	1,652.50
(b)	20 mm nominal bore	3	each	188.50	565.50
(c)	25 mm nominal bore	5	each	200.10	1,000.50
(d)	32 mm nominal bore	6	each	240.75	1,444.50
	TRADE TOTAL				147481.40
	<u>DRAINAGE</u>				
13.01	Providing, laying and jointing glazed stoneware pipes class SP-1 with stiff mixture of cement mortar in the proportion of 1:1 (1 cement : 1 fine sand) including testing of joints etc. complete :				
(a)	100 mm diameter	20	metre	206.55	4,131.00
(b)	150 mm diameter (for drainage and rainwater harvesting)	35	metre	314.35	11,002.25
(c)	200 mm diameter (for drainage and rainwater harvesting)	20	metre	462.15	9,243.00
13.02	Providing and laying cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) all-round S.W. pipes including bed concrete as per standard design:				
(a)	100 mm diameter S.W. pipe	20	metre	592.60	11,852.00
(b)	150 mm diameter S.W. pipe	35	metre	724.70	25,364.50
(c)	200 mm diameter (for drainage and rainwater harvesting)	20	metre	844.85	16,897.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
13.03	Providing and fixing square-mouth S.W. gully trap class SP-1 Complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design :				
(a)	150 x 100 mm size P type. : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	6	each	1,594.35	9,566.10
13.04	Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete :				
(a)	100mm dia. R.C.C. pipe	10	metre	318.50	3,185.00
(b)	150mm dia. R.C.C. pipe	20	metre	348.30	6,966.00
13.05	Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) with R.C.C. top slab with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand : 8 graded stone aggregate 40mm nominal size) inside plastering 12mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) finished with a floating coat of neat cement complete as per standard design :				
(a)	Inside size 90x80 cm and 45 cm deep including C.I. cover with frame (light duty) 455x610 mm internal dimensions total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	8	each	8,507.00	68,056.00
(b)	Inside size 120x90 cm and 90 cm deep including C.I. cover with frame (medium duty) 500mm internal diameter , total weight of cover and frame to be not less than 116 kg (weight of cover 58 kg and weight of frame 58 kg) : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	1	each	18,304.45	18,304.45
13.06	Extra for depth for manholes				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(a)	Size 90x80 cm With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	1	metre	5,638.20	5,638.20
(b)	Size 120x90 cm With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	1	metre	6,753.65	6,753.65
13.07	Providing M.S. foot rests including fixing in manholes with 20x20x10 cm cement concrete blocks 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) as per standard design :				
	With 20 mm diameter round bar	10	each	242.05	2,420.50
13.08	Making connection of drain or sewer line with existing manhole including breaking into and making good the walls, floors with cement concrete 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) cement plastered on both sides with cement mortar 1:3 (1 cement : 3 coarse sand), finished with a floating coat of neat cement				
13.09	For pipes 100 to 250 mm diameter Dismantling of manhole including R.C.C. top slab, C.I. cover with frame, including stacking of useful materials near the site and disposal of unserviceable materials into municipal dumps within 50 m lead :	2	each	364.6	729.20
	Rectangular manhole 90x80 cm and 45 cm deep	1	each	937.25	937.25
13.10	Providing and fixing S.W. intercepting trap in manholes with stiff mixture of cement mortar 1:1 (1 cement : 1 fine sand) including testing of joints etc. complete : 150 mm dia	1	each	392.85	392.85
13.11	Constructing brick masonry road gully chamber 50x45x60 cm with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) including 500x450 mm pre-cast R.C.C. horizontal grating with frame complete as per standard design : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	2	each	3,957.50	7,915.00
	(For Rainwater harvesting)				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
13.12	Constructing brick masonry road gully chamber 110x50x77.5 cm with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) including 500x450 mm pre-cast R.C.C. horizontal grating with frame and vertical grating complete as per standard design : with common burnt clay F.P.S.(non modular) bricks of class designation 7.5	2	each	7,501.45	15,002.90
13.13	Constructing brick masonry chamber for RW harvesting pipe/underground elctrical cable chamber and bends with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg), R.C.C. top slab with 1:2:4 mix (1 cement: 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design:				
(a)	Inside dimensions 455x610 mm and 45 cm deep for single pipe line : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	10	each	4,692.05	46,920.50
(b)	Inside dimensions 500x700 mm and 45 cm deep for pipe line with one or two inlets with common burnt clay F.P.S. (non modular) bricks of class designation 7.5	10	each	5,375.20	53,752.00
	TRADE TOTAL				325029.35
14.01	<u>RAIN WATER HARVESTING</u> Providing and laying in position cement concrete 1:5:10 (1 Cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) excluding the cost of centering and shuttering - All work up to plinth level :	2	cum	4004.00	8,008.00
14.02	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in Cement mortar 1:6 (1 cement : 6 coarse sand) in all shapes and sizes				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(a)	All work in foudations and up to plinth level	8	cum	4677.25	37,418.00
14.03	Providing & applying 12 mm cement plaster of mix : Internal work on walls				
(a)	1:6 (1 cement: 6 coarse sand)	30	sqm	158.40	4,752.00
14.04	Providing & applying 6 mm cement plaster of mix : Internal work on Ceiling/ RCC Work				
(a)	1:3 (1 cement : 3 fine sand)	10	sqm	134.70	1,347.00
14.05	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete for all levels.				
(a)	Thermo-Mechanically Treated bars	0.5	MT	68,100.00	34,050.00
14.06	Providing and laying in position reinforced cement concrete work of grade 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size) for all works, excluding the cost of centering, shuttering, finishing and reinforcement				
(a)	All works up to plinth level	2	cum	6230.20	12,460.40
14.07	CI Main Hole cover 610x455	2	cum	1872.00	3,744.00
14.08	Centering and shuttering including strutting, propping etc. and removal of form for :				
(a)	Suspended floors, roofs, landings, balconies and access platform.	20	sqm	401.65	8,033.00
14.09	Boring/drilling bore well of required dia for casing/ strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer -in-charge, upto 90 metre depth below ground level.				
(a)	All type of soil : 300 mm dia	20	RM	407.10	8,142.00
14.1	Supplying, assembling, lowering and fixing in vertical position in bore well, Supplying, assembling, lowering and fixing in vertical position in bore well, ERW (Electric Resistance Welded) FE 410 plain slotted having slot of size 1.6/3.20 mm mild steel threaded and socketed/ plain ended casing pipes of required dia, conforming to IS: 8110 of reputed and approved make, having wall thickness not less than 5.40 mm, including painted with outside surface with two coats				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
	of anticorrosive bitumestic paint of approved brand and manufacture, including hire & labour charges, fittings & accessories, all complete, for all depths, as per direction of Engineer-in-charge				
(a)	200 mm nominal size dia	20	mt	1,722.45	34,449.00
14.11	Supplying, filling, spreading & leveling stone boulders of size range 5 cm to 20 cm , in recharge pit, in the required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.	8	cum	504.15	4,033.20
14.12	Supplying, filling, spreading & leveling gravels of size range 5 mm to 10 mm , in the recharge pit, over the existing layer of boulders, in required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.	8	cum	910.65	7,285.20
14.13	Supplying, filling, spreading & leveling coarse sand of size range 1.5 mm to 2 mm in recharge pit, in required thickness over gravel layer, for all leads & lifts, all complete as per direction of Engineer -in-charge.	8	cum	852.60	6,820.80
14.14	Development of tube well in accordance with IS : 2800 (part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method, measuring static level & draw down etc. by step draw down method, collecting water samples & getting tested in approved laboratory, i/c disinfection of tubewell, all complete, including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in-charge.	8.00	hours	677.1	5,416.80
14.15	Providing and fixing suitable size threaded mild steel cap or spot welded plate to the top of bore well housing/ casing pipe, removable as per requirement, all complete for borewell of: 200 mm dia	1	each	243.90	243.90
14.16	Providing and fixing M.S. clamp of required dia to the top of casing/housing pipe of tubewell as per IS: 2800 (part I), including necessary bolts & nuts f required size				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
	complete.				
	200 mm clamp	1	each	1,329.35	1,329.35
14.17	Providing and fixing Bail plug/ Bottom plug of required dia to the bottom of pipe assembly of tubewell as per IS:2800 (part I).				
	200 mm dia	1	each	265.85	265.85
	TRADE TOTAL				1,77,798.50
15	SOAKPIT				
15.01	Providing and laying in position cement concrete 1:5:10 (1 Cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) excluding the cost of centering and shuttering - All work up to plinth level :	0.5	cum	4004.00	2,002.00
15.02	Providing and laying in position reinforced cement concrete work of grade 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size) for all works, excluding the cost of centering, shuttering, finishing and reinforcement				
(a)	All works up to plinth level	1	cum	6230.20	6,230.20
(b)	Suspended floors, roofs, landings, balconies and access platform.	5	sqm	401.65	2,008.25
15.03	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete for all levels.				
(a)	Thermo-Mechanically Treated bars	0.25	MT	68,100.00	17,025.00
15.04	Making soak pit 2.5 m diameter 3.0 metre deep with 45 x 45 cm dry brick honey comb shaft with bricks and S.W. drain pipe 100 mm diameter, 1.8 m long complete as per standard design with common burnt clay FPS (non modular) bricks of class designation 7.5 including excavation etc complete	1	each	18,309.50	18,309.50
	TRADE TOTAL				45,574.95

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
16	ANTI TERMITE TREATMENT				
16.01	Injecting chemical and emulsion chloropyrifos emulsifiable concentrate IS 6944- 1974 - 1% (20 EC) to be used as per manufacturer's specifications for pre-constructional antitermite treatment and creating a chemical barrier as per IS - 6313 PART II, 1981 (or latest) in wall trenches, foundations, basement, top surfaces of plinth filling, junction of walls and floors along the external perimeter of the bldg. surrounding of pipes etc. complete. The work shall be executed through approved agency / agencies and with guarantee of 10 years. including as directed below. Using chemical emulsion as per IS Specification for :-				
1	Back filling in immediate contact with masonry foundations.				
2	Junctions of walls and floors.				
3	External perimeter of the bldg.				
4	Bottom and sides of trenches.				
5	Top surface of plinth filling. (Rate shall be quoted for plinth area at Ground floor only. Plinth area shall be measured for payment.)	215	sqm	402.00	86,430.00
	TRADE TOTAL				86,430.00
17	Electrical works				
	INTERNAL WIRING				
17.01	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 volts, on surface/recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
a	4 way (4 + 12), Double door	3	Each	2175	6525
17.02	Supplying and fixing 5 amps to 32 amps rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load offollowing poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a	32 ATripole pole and neutral (incomer)	3	Each	887	2661
b	40 AMP FPELCB	3	Each	2123	6369
c	5/10/16/ 20 AMP SPMCB(outgoing)	27	Each	169	4563

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
17.03	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copperconductor, single core cable in surface/ recessed medium class PVC conduit as required.				
a	For Sub mains 4 X 6 sq. mm + 2 X 6 sq. mm earth wire	100	RM	389	38900
b	For Circuit wiring 2 X 2.5 sq. mm + 1 X 2.5 sq. mm earth wire	100	RM	131	13100
17.04	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm. FRLS PVC insulated copper conductor single core cable etc. as required.	70	Each	585	40950
17.05	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
a	3 pin 5/6 amp socket outlet (on board 5A SS)	19	Each	79	1501
b	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm. FRLS PVC insulated copper conductor single core cable etc. as required. (For 3pin 5/6 A Socket out let away from board)				
c	3 pin 5/6 amp socket outlet (away from Switch board 5A SS)	19	each	518	9842
D	Wiring for light/ power plug with 2X4 sq. mm FRLS PVC insulated copper conductor single core cable in surface/recessed medium class PVC conduit alongwith 1 No 4 sq. mm FRLS PVC insulated copper conductor single core cable for loop earthing as required	250	Each	162	40500
E	6 pin 15/16 amp socket outlet	16	Each	150	2400
F	Supply, Assembling, Erection and Testing ceiling Fans of 1200mm including providing necessary down wiring connector from ceiling rose to Fan motor.	16	Each	1600	25600

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
G	Supplying and fixing stepped type electronic fan regulator on the existing modular plate switch box including connections but excluding modular plate etc. as required.	16	Each	284	4544
H	-- do -- extension of light / fan point.	4	Each	150	600
17.06	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess	16	Each	750	12000
a	20 mm	170	RM	53	9010
b	25 mm	170	RM	65	11050
17.07	AC Point-Wiring - do -- as above but with 2 x 4 Sqmm PVC insulated FRLS copper conductor wire and earth wire of 2.5 sqmm. PVC insulated FRLS copper conductor wire in PVC conduit (Medium) including providing and fixing of 4 module power unit with 25 Amp Starter plug and top to be provided in conceal / on surface of wall as per direction and making connections.	3	Each	889	2667
a	Supplying and fixing call bell/ buzzer suitable for single phase, 230 volts, complete as required.	3	Each	61	183
b	Supply & fixing of Bell push	3	Each	111	333
17.08	Supply & fixing of Telephone socket outlet	6	Each	95	570
17.09	Supply & fixing of TV Socket out let	3	Each	94	282
17.10	Supplying and drawing co-axial TV cable RG-6 grade, 0.7 mm solid copper conductor PE insulated, shielded with fine tinned copper braid and protected with PVC sheath in the existing surface/ recessed steel/ PVC conduit as required.	75	RM	28	2100
17.11	SITC of 10 pair Junction box for telephone cable of approved make.	1	Each	500	500
17.12	Supplying and drawing following pair 0.5 mm dia FRLS PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/recessed steel/ PVC conduit as required.	50	RM	18	900
17.13	Supplying and fixing 300mm sweep wall Exhaust fan suitable for use 220/230 volts 50 cycle single phase AC supply including providing and fixing with 6mm thick commercial ply board complete with connection. Make:- Bajaj/ Crompton/ GEC	9	Each	1700	15300

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
17.14	Supply, Assembling,Erection and Testing ceiling Fans of 1200mm including providing necessary down wiring connector from ceiling rose to Fan motor.	16	Each	1600	25600
17.15	Providing and fixing 125mmx125mmx75mm fan dowel boxes with necessary M.S.fan hook and covered with bakelite sheet as per site condition.	16	Each	80	1280
17.16	P/F 1X40W box type fluorescent fitting with low loss copper choke, tube rod, condenser , side holder etc. to be fixed on the wooden round blocks complete with connection. Make:- Philips/ Wipro/ Crompton.	22	Each	600	13200
17.17	Electrical service connections Providing and laying 4 core 35 Sqmm PVC insulated aluminium conductor armoured cable 1.1KV grade on wall/ surface or cancealed manner or in trenches including excavation of cable trenches and providing sand cushioning and brick lining alongwith 2Nos. 8 SWG GI earth wire, brick covering and refilling the earth. The rates shall include providing and fixing necessary cable end box etc. as required at site. including connections and termination on either sides.	500	RM	391.00	195500
17.18	--do--as above but with 2 core 2.5 sq.mm copper cable with 1 No. 8 SWG GI earth wire(for Compound lights)	140	RM	130.00	18200
17.19	--do-- as above but 3 core 4 sq.mm PVC insulated copper cable with in 25 mm GI pipe "B"clas with necessary accessories as required at site along with 2nos 8 SWG GI earth wire (for Pump sets)	75	RM	225.00	16875
17.20	Supplying and fixing cable route marker with 10 cm X 10 cm X 5 mm thick G.I. plate with inscription there on, bolted /welded to 35 mm X 35 mm X 6 mm angle iron, 60 cm long and fixing the same in ground as required.	3	Each	288	864
17.21	(METER PANEL)Supplying installation testing and commissioning of Sleek type cubical panel fabricated out of 2mm sheet steel and suitable frame work having independent compartments for SFU/ MCCB's/ MCB's etc. The panel shall be wall/floor mounted it	1	Set	23500	23500

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
	should be degreased, anti rust treated with two coats of red oxide primer and finished with two coats of powder coated paint. The panel shall have ventilator slots covered with wire mesh from inside. The panel door shall be inter locked with switch gears and have neoprime gasket. The design of the panel shall be such as to offer maximum safety and ease for maintenance. The busbars shall be of tinned copper and supported on non inflammable epoxy cast iron insulators.				
(i)	The terminators of cable/wire shall be from top or bottom as per site requirement. Engraved name plates shall be provided for each feeder cubical panel shall consist of following switch gears including copper leads between busbars and switch gears. 1 no. 100 A FP MCCB (25 KA breaking capacity) incomer. Make:- Crompton/ MDS/ L&T/ SIEMENS.				
(ii)	1 set of Copper bus bar (4 nos.) of size 40x5x1000mm on porcelain insulators complete with incoming and outgoing connections, earthing etc.				
iii)	Space provision for housing 4 Nos (3nos for 3 Quarters and 1 no for Street/common light/Pump room DB) Electronic Energy Meter (3 Phase) with glass window				
iv)	5 nos, 32 Amp TPN MCB (To be fitted in the above Panel for out going to the 3 quarters, 1no for streelight DB and 1 no for Pump room.)				
v)	1 no,32 A DP MCB for out going to the street light DB				
vi)	Ammeter, Voltmeter complete with selector switches				
vii)	1 set of pilot lamps with switches and fuses.				
17.22 (A)	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	3	Set	4490	13470
B	Supplying & fixing of 25X5 mm GI earth strip but in 32 mm GI pipe.	25	RM	270	6750
C	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	25	RM	142	3550

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
D	Providing and fixing M.V. danger notice plate of 200 mm X 150 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single red colour on front side as required.	2	Each	141	282
17.23	Compound and Street Light Supply, Instalation, Testing and Commissioning of CFL Post Top luminiare of Philips/Wipro/Crompton make similar to catalogue no.BRTPCI 118 clear lamp suitable for 11 watts CFL lamps including lamp post made out of 50mm. dia class "B" GI pipe with 12mm base plate 150mmX150mm approx.welded to the bottom of pipe.The entire post shall be 4.5 Mtr length.The post is to be installed in a pit of 1.5 Mtr(min) depth duly concreted upto ground level.The work shall include the following: (a) Making concrete pedestal upto 300 mm above ground level from bottom.	8	Each	4500	36000
	(b) providing and fixing Water proof MS box comprising and including DPMCB 6Amp and Heavy duty bakelite connector (or links for phase and neutral separately).				
	(c) Providing wiring from MS box to the luminiare by means of 3X1.5sqmm. PVC insulated copper wire.				
17.24	(d) Painting pole with one coat of red primer and two coats of enamel paint of approved shade.The concreting shall be done in 1:2:4 nominal mix. Supply, Installation, Testing and Commissioning of Post top luminaire (for Gate) of Philips / Wipro / Crompton make similar to catalogue no.BRPTCI- 118 with x18 watts CFL lamps . The work includes providing & fixing following:	2.0	Each	3800	7600
	(a) Suitable length of class "B" GI pipe of appropriate dia. compatible with the fitting, for its mounting, suitably grouted in gate pillar. (b) Water proof MS Box in the pillar comprising and including DPMCB and Bakelite connector (or one link each for Phase and Neutral)				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
	(c) Wiring from MS box to light fitting by means of 3X1.5sqmm PVC insulated copper wire in MS conduit as required. (one wire each for Phase, Neutral and earth)				
17.25	Supply & Fixing bulk head fittings of Bajaj/Crompton make with 18 W CFL Lamp.	6	Each	470	2820
17.26 A	Supplying, Installation, Testing and Commissioning of 1 HP Monoblock PumpSet Minimum (3 star rated)at site suitable for operation on 3-Phase 400/440 V A.C. 50 Hz supply with suitable head and discharge . The Pump set shall be Installed on suitable size of P.C.C.(1:2:4) foundation with suitable grouting arrangements. Providing and fixing necessary nut and boltsetc. complete as required.	2	Each	30000	60000
B	The Pumpset shall be installed on suitable size of P.C.C. (1:2:4) Foundation with suitable grouting arrangements. Providing and fixing necessary nuts and bolts etc. complete as required.				
C	D.O.L. starters suitable for 2 h.p. 3 phase 400/440 v pump set with suitable relay, contactors, push buttons, no volt release coil, over load relay etc complete as required.(L& T,Crompton, Seimens)	2	Each	1500	3000
	TRADE TOTAL				681441.00

SUMMARY OF COST

S. No.	Description	Amount (Rs)
1	EARTH WORK	305511.75
2	CEMENT CONCRETE (PCC)	312112.90
3	RCC WORK	1534518.25
4	BRICK WORK	1002915.00
5	STEEL REINFORCEMENT & STEEL WORKS	1278499.70
6	MARBLE AND GRANITE WORK and FLOORING	862010.70
7	FINISHING	699460.00
8	WOOD AND PVC WORK	791315.90
9	ROAD WORK	381434.40
10	WATERPROOFING WORK	316704.50
11	SANITARY INSTALLATION	283112.20
12	WATER SUPPLY	147481.40
13	DRAINAGE	325029.35
14	RAIN WATER HARVESTING	177798.50
15	SEPTIC TANK AND SOAKPIT	45574.95
16	ANTI TERMITE TREATMENT	86430.00
17	ELECTRICAL	681441.00
	GROSS TOTAL	9231350.50
	SAY	9231351.00

LIFE INSURANCE CORPORATION OF INDIA**CHIEF ENGINEER'S OFFICE, NORTHERN ZONAL OFFICE, NEW****TENDER FOR BUILDER'S WORK, WATER SUPPLY, SANITARY INSTALLATION,
ELECTRICAL INSTALLATION AND OTHER ANCILLARY WORKS FOR
CONSTRUCTION OF OFFICERS' QUARTERS BUILDING AT JAITARAN (RAJ.)****SUMMARY**

Note: Tenderers are to quote a single percentage BELOW / ABOVE / AT PAR on the Net Total amount only. Trade wise percentage, if quoted, shall not be accepted and such tenders shall be considered non bonafide.

Quote the percentage up to **TWO** Decimal only.

Amount Put to Tender =	Rs. 9231351.00
<u>(Rupees Ninety Two Lakhs Thirty One Thousand Three Hundred Fifty One Only)</u>	
Less prime Cost (TI no8.09)	(-) Rs 55000/-
Net total:	Rs. 9176351.00/- A

I/We Quote my/our percentage rates

Below / At Par / above

.....PERCENTAGE

Rs. 9176351.00/- A

(+ / -) Rs.....

Total Amount considering percentage rates Rs.....

Below/At Par/ above

Add Prime Cost (+) **Rs 55000/-**

=====

Net amount **Rs.....****Net amount words: Rs.....**

.....only)

Signature of contractor with seal & date**Chief Engineer**

(Strike out whichever is not applicable)				
Quote Percentage				Percentage Amount
ABOVE	In Figure	(+)	%	(+) Rs.
	In Words		%	(+) Rupees
AT PAR	In Words			
BELOW	In Figure	(-)	%	(-) Rs.
	In Words		%	(-) Rupees
Total Quoted Amount after applying Percentage (In Figures)			Rs.	
Total Quoted Amount after applying Percentage (In Words)			Rupees	

Note: Please refer the above “Total Quoted Amount” in the letter from Contractor to Chief Engineer



CHIEF ENGINEER'S OFFICE
NORTHERN ZONAL OFFICE, NEW DELHI

PART – II

**TENDER FOR BUILDERS WORK, WATER SUPPLY,
SANITARY INSTALLATION, ELECTRICAL INSTALLATION
AND OTHER ANCILLARY WORKS**

FOR

**CONSTRUCTION OF
OFFICERS' QUARTERS BUILDING**

AT

JAITARAN (RAJ.)

Issued to

M/S _____

Date of Pre-Bid Meeting : 08.02.2015 at 11.00 Hrs.

Last Date of Submission of tender : 16.02.2016 up to 15.00 hrs.

Date of opening of Pre-Qualification Bid: 16.02.2016 at 15.30 hrs.

Note: Contractors should sign all the pages of Tender Documents.

**LIFE INSURANCE CORPORATION OF INDIA
NORTHERN ZONAL OFFICE,
NEW DELHI**

**TENDER FOR BUILDER'S WORK, WATER SUPPLY, SANITARY
INSTALLATION, ELECTRICAL INSTALLATION AND OTHER
ANCILLARY WORKS FOR CONSTRUCTION OF
OFFICERS' QUARTERS BUILDING AT JAITARAN (RAJ.)**

PART – II

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		Life Insurance Corporation Of India Northern Zonal Office, Engineering Deptt, 2 nd Floor, 25, K.G.Marg, NEW DELHI-110 001 Tel: 011-28844180, 28844182, e-mail: nz_engg@licindia.com			
<u>DIRECT TENDER NOTICE</u>					
Life Insurance Corporation of India intends to invite Percentage Rate Tender under THREE BID Tendering System for Construction of OFFICERS' QUARTERS BUILDING at JAITARAN (RAJ.) which includes Main Building work including Civil, Plumbing, Sanitary, Electrical work, & Ancillary works etc. The proposed construction shall be of R.C.C. framed structure with modern Architectural finishes of high order having Ground plus One floor with a Total Built-Up Area of 6450 Sqft (Approx).					
The Eligibility Criteria are as detailed below:-					
Estimated Cost (Rs. In Lac)	Completion period in months	Minimum Bank Solvency* (Rs. In Lac)	Average Annual Turnover during last 4 years (Rs. In Lac) 2011-12, 2012-13, 2013-14 & 2014-15	Qualifying Value of Similar Nature** of Single work completed during last 7 years prior to date of publication of this Notice (Rs. In Lac)	Bidding Capacity# (Rs. In Lac)
A	B	C	D	E	F
92.31	09	18.46	46.16	1. <u>Three similar</u> completed works costing not less than the amount equal to Rs. 36.93 Lac OR <u>Two similar</u> completed works costing not less than the amount equal to Rs.55.39 Lac OR <u>One similar</u> completed work costing not less than the amount equal to Rs.73.85 Lac AND 2. <u>One completed work of any nature</u> (either part of above or a separate one) costing not less than the amount equal to Rs. 36.93 Lac with some Central Govt. Deptt./ State Govt. Deptt./ Central Autonomous Body/ State Autonomous Body/ Central Public Sector Undertaking/ State Public Sector Undertaking/ City Development Authority/ Municipal Corporation of City Formed under any act by Central/ State Govt. and published in Central/ State Gazette.	Equal to or more than 92.31

Selection Criterion for working Contractors in L I C of India (LIC): Working contractors of LIC of India means the Contractors who have executed similar nature of work** in LIC or else where during the last seven years prior to date of publication of this Tender Notice and fulfilling all the eligibility criteria.

A	B	C	D	E	F
92.31	09	15.69	39.23	1. <u>Three similar</u> completed works costing not less than the amount equal to Rs. 31.39 Lac OR <u>Two similar</u> completed works costing not less than the amount equal to Rs.47.08 Lac OR <u>One similar</u> completed work costing not less than the amount equal to Rs.62.77 Lac AND 2. <u>One completed work of any nature</u> (either part of above or a separate one) costing not less than the amount equal to Rs.31.39 Lac with some Central Govt. Deptt./ State Govt. Deptt./ Central Autonomous Body/ State Autonomous Body/ Central Public Sector Undertaking/ State Public Sector Undertaking/ City Development Authority/ Municipal Corporation of City Formed under any act by Central/ State Govt. and published in Central/ State Gazette.	Equal to or more than 92.31

* **Solvency certificate** should not be more than 3 months old prior to date of publication of this Notice.

** **Similar Nature of work:** i.e. Building work which may be Office, Residential Buildings, Shopping complex, Commercial Buildings but not Industrial Buildings like Ware house, factories, Plant etc.

The bidding capacity shall be worked out by the following formula:

Bidding Capacity = $[A \times N \times 2] - B$, Where,

A= Maximum value of similar nature of works executed in any one year during the last four years prior to the date of publication of this Tender Notice, taking into account the completed as well as the works in progress.

N = 9/12 (years)

B=Value of existing commitments and on going works to be completed within 09 months from last date of submission of Tender for this work.(An affidavit duly notarized in support of this statement is must)

Only those contractors who have executed similar nature of work of required amount (Similar nature of work means Building work which may be Office, Residential Buildings, Shopping complex, Commercial Buildings but not Industrial Buildings like Ware house, factories, Plant etc.), and fulfilling the above criteria are eligible to submit the duly filled-in Enrolment Form and Tender, which will be available on our website and are to be downloaded from **24.01.2016 to 15.02.2016**.

The **Pre-Qualifying Bid** containing duly filled-in **Enrolment Form** along with the Annexure A1, A2 and B to G and the **Integrity Pact**, **EMD Bid** containing the EMD in the form of DD/ Pay Order and **Financial Bid** containing duly filled-in **Part-II** of the Tender with the Pre-priced schedule of Quantity, are required to be submitted to **The Chief Engineer**, Engineering Deptt, Northern Zonal Office, 'Jeevan Prakash', 2nd Floor, 25, K.G. Marg, NEW DELHI-110001 on or before **16.02.2016 till 15.00 hrs.**, along with **non-refundable Tender Cost of Rs.5000.00 (Rupees Five Thousand only), {Rs.2000.00 as Enrolment form fee and Rs.3000.00 as Tender document fee}**, payable in form of Demand Draft/ Pay Order in favour of "**Life Insurance Corporation of India**" payable at New Delhi.

The **Pre-Qualifying Bid**, **EMD Bid** and **Financial Bid** shall be completely filled in all respects, along with these instructions for filling and submission of the **Tender**.

1. **Envelope-1** : The **Tender Cost, Enrolment Form Fee and EMD** of prescribed amount (Refer instructions of Tender (Part-II), in the form of Demand Draft/ Pay Order/ Bank Guarantee shall be put in a separate sealed envelope, duly super scribed as **Envelope-1**.
2. **Envelope-2 : Pre-Qualifying Bid** containing duly filled-in Enrolment Form with credentials of the applicant to be submitted in the specified format along with all supporting documents like Solvency Certificate from Banker, Work Completion Certificate for works executed during last 7 years, Certificates for works in progress, availability of Tools, plants, machineries and manpower, Constitution of the Organization, Bank Statement for last 12 months, Service Tax Registration Certificate, Statement of Accounts for last 4 consecutive years duly certified by Chartered Accountant with Registration number etc. These documents are to be self attested by the authorized person of the applicant with an undertaking that full responsibility is taken by him/ her on behalf of the applicant for submitted documents' veracity. **The Bidders have also to submit an integrity pact along with the Pre-Qualifying Bid.** All these documents shall be submitted in a sealed envelope duly super scribed as **Envelope-2**.
3. **Envelope-3** : The **Financial Bid** containing the **Part-II** of the Tender including the filled-in **Pre-Priced Schedule of Quantities**, shall be submitted in a separate sealed envelope duly super scribed as **Envelope-3**.

All these Three envelopes shall be sealed in a Bigger Envelope duly super scribed with the Name of the work, Name of Applicant with full postal address with Telephone number and email id., and, the last date for submission of the tender.

Please note that the Part-I of the Tender is not required to be submitted initially while submitting the Tender. However, It will be a part of Contract Agreement with the successful Bidder.

The PRE-BID MEETING will be held in the Chief Engineers Office at the above address on 08.02.2016 at 11.00 hrs.

Technical bid comprising of Envelope 1(EMD) Envelope 2(Enrolment form and supporting documents) will be opened at 15:30 hrs on 16.02.16

Note: The contractors will be selected only after satisfactory verification of the genuineness of the Bank Solvency and Credentials of the submitted documents by collecting Confidential report of executed works from their clients &/or Site inspection report of executed work/ work in progress etc. The credentials of works executed under Joint-Ventures system and applications from Joint Venture agencies shall not be accepted.

The Chief Engineer reserves the right to reject the Tender submitted by any or all contractor/s at his sole discretion without assigning any reason whatsoever.

Date: 24.01.2016

Chief Engineer

LIFE INSURANCE CORPORATION OF INDIA
INSTRUCTIONS IN REGARD TO SUBMISSION OF TENDERS

NOTE : Tenderer should note that non-compliance of the following instructions will render the tender liable for rejection.

1. **Address to which the tender marked “Original”(PINK COVER Page) is to be submitted :**

The Chief Engineer, L.I.C. of India, Northern Zonal Office, Jeevan Prakesh, 2ndFloor, 25 K.G. Marg , New Delhi – 1100 001.
 2. (a) **Last date for receipt of tenders: 16.02.2016 upto 15:00 hours**

(b) **Date of Pre-Bid Meeting : 08.02.2016 at 11.00 hours in the Office of the Chief Engineer at the address mentioned above.**
 3. Tenderer should ensure that the tender is received before the date and time specified above.
 4. Tenderer should fill in all the relevant blanks and put his signature on the relevant places as indicated below :
 - a. Letter from Contractor to Chief Engineer
 - b. Appendix to the “Conditions of Contract”
 - c. Appendix to the “General Instructions to the Contractors”
 - d. Last page of the General Preambles to Schedule of Quantities
 - e. Every page of schedule of quantities and general summary.
 5. The schedule of Quantities should be filled as follows :
 - a. The “Rate” column to be legibly filled in ink in both FIGURES AND WORDS.
 - b. “Amount” column to be filled for each item and the total amount for each trade to be given.
 - c. All corrections to be initialled.
 - d. Each page of the Schedule of Quantities and the “General Summary” is to be signed by the Contractor.
 - e. Tenderer should note that he is to quote **Percentage Below/ At Par/ Percentage Above**, over our pre-priced schedule of rates.
- Note:** The subject tender being invited on **PERCENTAGE** rate basis the clause Nos. 5 (a) & (b) are not applicable for this tender.
6. No alterations or additions are to be made by the tenderer to the text or the Schedule of these tender papers. Any tender which proposes any alterations to any of the condition/s laid down or which proposes any other conditions of any description whatsoever is liable to be rejected.
 7. The tenderer is required to check the numbers of the pages and should any be found missing or in duplicate, or the figure or writing indistinct, he must inform the

Chief Engineer / Issuing Officer at once and have the same rectified. Should the tenderer be in doubt about the precise meaning of any item or figure, for any reason whatsoever, he must inform Chief Engineer in order that the correct meaning may be decided upon before the date for the submission of the tender.

8. No liability whatsoever will be admitted nor claim allowed in respect of errors in the submitted tender due to missing / duplicate pages, indistinct writing or any other error in the tender documents which should have been rectified in the manner described above.
9. Proforma of Articles of Agreement (Annexure – ‘A’) should not be filled in by the tenderer. While the contract shall be deemed to have come into existence on issue of letter of acceptance to the successful tenderer, formal agreement shall be signed thereafter with the successful tenderer on non-judicial stamp paper of requisite value as per the proforma of Articles of Agreement.
10. Earnest Money accompanying the tender will be accepted in the form of “**CROSSED DEMAND DRAFT**” of any of the Nationalised Banks or Scheduled Banks drawn in favour of the “**LIFE INSURANCE CORPORATION OF INDIA**” payable at NEW DELHI only, and not in favour of any other Authority or location. In addition to this, Earnest Money can also be accepted in the form of Bank Guarantee. In such cases, 50% of EMD or Rs.20 lacs whichever is less, is to be deposited in the form of Cash (upto Rs. 49,999/- only) / Demand Draft (DD) / Pay Order (PO) / Banker's Cheque (BC) and balance amount will be in the form of Bank Guarantee (BG) issued by a Nationalised or Scheduled Banks. The Bank Guarantee (BG) shall be accepted at the time of opening of tender after due verification from the issuing bank authorities. The Earnest Money given by all the tenderers except the lowest tenderer will be refunded within seven working days from the date of opening of tenders.
11. The tender shall be accompanied by a certified true copy of Power of Attorney in favour of the signatory to the tender documents. If the tender is submitted on behalf of a firm, it must be signed either by all partners or person holding a valid power of attorney from all partners constituting the firm. The person signing the tender on behalf of another partner(s) or on behalf of a firm on Company shall attach with the Tender a proper Power of Attorney duly executed in his favour by such other person(s) or by all the partners in accordance with the Constitution of the Company / Articles of Association, stating that he has the authority to sign on behalf of such other person(s) of the firm or the Company as the case may be, in all matters pertaining to the contract including the Arbitration Clause.
12. Contractors are warned that Cash, or Insurance Guarantee, or Fixed Deposit receipt in lieu of the aforementioned form of Earnest Money remittance will not be accepted.
13. **The Part-II of the tender along with the Enrolment Form and EMD should be submitted as detailed in the Direct Tender Notice/ Enrolment Form.** Please note that the Part-I of the Tender is not required to be submitted initially while submitting the Tender. However, It will be a part of Contract Agreement with the successful Bidder.

14. The rates mentioned in the Part –II of the tender copy will be taken as bonafide. When the rates in figures and words are at variance, the rate corresponding to the amount shall be taken as correct. In all other cases rate in words will be taken in precedence over the rate in figures.
15. Tenders containing errors are liable to be considered non-bonafide at the discretion of the Chief Engineer
16. Tenderer should note that tender should remain open for consideration for a minimum period of **THREE MONTHS** from the date fixed for the receipt of tenders.
17. The Life Insurance Corporation of India reserves the right to accept any tender or to accept tenders in part; to reject any or all tenders without assigning reasons thereof.
18. Contractors should fill in “**Quoted percentage/Total Quoted Tender amount**” column in the **SUMMARY** legibly in ink in both **FIGURES** and **WORDS**. **Total Quoted Tender amount** mentioned in words shall be prefixed and suffixed by “**Rs.**” And “**only**” respectively. Tenders containing the **Quoted percentage/Total Quoted Tender amount** only in figures are liable to be considered non-bonafide at the discretion of the Chief Engineer and entail forfeiture of Earnest Money Deposit.
19. If on check there are differences between the **Quoted percentage** given by the contractor in words and figures, or in the Quoted Tender amount worked out or no Tender amount quoted by him the following shall be considered:
 - a) When there is a difference between the Quoted percentage in figures and in words, the Quoted percentage which correspond to the Total Quoted Tender amount worked out by the contractor, shall be taken as correct.
 - b) When the Quoted percentage by the contractor in figures and in words tallied but the amount is not worked out correctly, the Quoted percentage by the contractor shall be taken as correct and not the amount.

LIFE INSURANCE CORPORATION OF INDIA

LETTER TO CONTRACTOR FROM CHIEF ENGINEER

To,

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Dear Sir / Sirs,

SUB: TENDER FOR BUILDER'S WORK, WATER SUPPLY, SANITARY INSTALLATION, ELECTRICAL INSTALLATION AND OTHER ANCILLARY WORKS FOR CONSTRUCTION OF OFFICERS' QUARTERS BUILDING AT JAITARAN (RAJ.)

We forward herewith PART-I of TENDER (consisting of standard tender conditions, specifications etc.) and PART-II of TENDER (Schedule of Quantities etc.) for above referred work. Please note that one copy PART-II of the tender duly filled in should be submitted to **The Chief Engineer, L.I.C. of India, Northern Zonal Office, Jeevan Prakesh, 2nd Floor, 25 K.G. Marg, New Delhi – 1100 001**, in the sealed envelope as detailed in the Direct Tender Notice, so as to **reach on or before 15:00 hours on 16.02.2016. Please note that the Part-I of the Tender is not required to be submitted initially while submitting the Tender. However, It will be a part of Contract Agreement with the successful Bidder. The Date of Pre-Bid Meeting is 08.02.2016 at 11.00 hours in the Office of the Chief Engineer at the address mentioned above.**

- 1) The tender drawings for the work are attached with Part-II.
- 3) Sealed tenders in the self addressed envelope and accompanied by **Earnest Money Deposit of Rs. 1,38,500.00 (Rupees)** along with filled-in Enrolment Form will be received at the office of Chief Engineer at above address **on or before 15:00 hours on 16.02.2016** and the **Pre-Qualification Bids** will be opened on **16.02.2016 at 15.30 hours** in the presence of contractors or accredited representatives, who attend. Tenderer should ensure that their tender is received before the date and time specified as no consideration whatsoever shall be given for postal or any kind of delays. Tenders received late shall be rejected.
- 4) If tender is delivered by hand, tenderer must ensure that the date and time of receipt is endorsed on the tender envelope by the A.O. or any other Officer of the Department approved by the SE / EE (Planning) and thereafter the tender is deposited in the tender box by the tenderer or his representative.
- 5) The Life Insurance Corporation of India does not bind itself to accept the lowest or any tender.

Yours faithfully,

CHIEF ENGINEER

LIFE INSURANCE CORPORATION OF INDIA**LETTER FROM CONTRACTOR TO CHIEF ENGINEER**TO BE SUBMITTED ON OR BEFORE **15.00 hours on 16.02.2016**

Date:

To,
The Chief Engineer
LIC of India,
Engineering Department,
2nd Floor,
Jeevan Prakash,
25 K.G.Marg,
New Delhi-1100001

NAME OF WORK: TENDER FOR BUILDER'S WORK, WATER SUPPLY, SANITARY INSTALLATION, ELECTRICAL INSTALLATION AND OTHER ANCILLARY WORKS FOR CONSTRUCTION OF OFFICERS' QUARTERS BUILDING AT JAITARAN (RAJ.).

Dear Sir,

1. Having examined and understood the Specifications of the materials for its supply at the site of work as well as for labour for all types of work including specialized work, Conditions of Contract and General Instructions relating to Part-I of tender and Schedule of Quantities relating to the above work of PART II of the tender and the drawings and other related terms and conditions, amendments etc. and having visited and examined the site of the proposed works and having acquired the requisite information relating thereto as affecting the tender invited by you on behalf of the Life Insurance Corporation of India, I/We, the undersigned hereby offer to construct, execute, complete and maintain the proposed works on **PERCENTAGE RATE** basis in strict accordance with the Contract Conditions and Specifications for the sum of Rs. _____ /-(Rupees _____ only) or such other sums as may be ascertained in accordance with the said Conditions.
2. I/We, undertake to complete and deliver the whole of the works within a period as specified in Appendix to the Conditions of Contract from the date of issue of intimation from you that the tender has been accepted and upon receiving possession of the site. I/We, shall be under the obligation to pay the sum as stated in the Appendix to the Conditions of Contract for every day that the works shall remain incomplete, damages as compensation subject to the Conditions of Contract relating to extension of time.
3. I/We, enclose herewith my/our tender along with **Earnest Money Remittance of Rs..... (Rupees only)** in the form of **CROSSED DEMAND DRAFT PAYABLE AT New Delhi** (put in a separate sealed envelope). I/We, hereby agree that this sum shall be forfeited by us to the 'Life Insurance Corporation of India' in the event of my/our tender being accepted and I/We, fail to execute the Contract when called upon to do so, as detailed in the Appendix to the Conditions of Contract.

4. *The Earnest Money Deposit of Rs. _____/-
(Rupees _____ only) is
enclosed in the form of Demand Draft drawn on _____ and
payable at New Delhi.

OR

- * The Earnest Money Deposit of Rs. _____/-
(Rupees _____ only) is enclosed
in the form of Demand Draft drawn on _____ and payable at New Delhi.

AND

Balance Earnest Money Deposit of Rs. _____/-
(Rupees _____ only)
is enclosed in the form of Bank Guarantee issued by _____ and payable at
New Delhi.

Note : An amount equal to 50% of EMD or Rs.20 Lac, whichever is less, needs to be deposited in the form of Cash (upto Rs.49,999/- only) / Demand Draft (DD) / Pay Order (PO) / Banker's Cheque (BC) issued by a Nationalized or Scheduled Bank and payable at New Delhi and balance EMD amount can be deposited in the form of Bank Guarantee (BG) issued by a Nationalized or Scheduled Bank as per specimen given in Annexure "E" to Conditions of Contract (put in a separate envelope supplied by LIC).

OR

*The EMD of Rs. _____ has been deposited in cash (upto Rs.49,999/- only) in the Accounts Dept. of _____ and M.R.No. _____ dt. _____ is enclosed (♠)

5. In the event of the tender being accepted:

* I/We, agree to the retention of my/our EMD as a part of Security Deposit and the balance amount of Security Deposit to be recovered at 7.5% of Gross Value of work done from my / our Running Account Bills.

OR

* I/We, agree to furnish a lump sum Security Deposit amounting to Rs. _____ (Rupees _____ only) in the form of Bank guarantee from any Nationalized Bank or Scheduled Bank located at _____ or _____ as per specimen given in Annexure "B" to Conditions of Contract, within 21 (Twenty One) days from the date of issuance of acceptance of tender or within 21 (Twenty One) days from the extended date as may be extended by the Chief Engineer.

6. I/We, note that the Earnest Money Deposit of Rs. _____/-
(Rupees _____ only) would be refunded to me/us.

- a. On expiry of the validity of the tender or earlier at the discretion of Chief Engineer in case my/our tender is not accepted and

- b. In case my/our tender is accepted, after I/We, furnish Bank Guarantees as mentioned above.

Yours faithfully,

(SIGNATURE OF THE CONTRACTOR)

Name and Seal

NAME OF THE PARTNER OF THE FIRM

OR

NAME OF THE PERSON HAVING POWER OF
ATTORNEY TO SIGN THE CONTRACT
(CERTIFIED TRUE COPY OF THE POWER
OF ATTORNEY SHOULD BE ATTACHED)

***Strike out whichever is not applicable**

(♠) EMD amounting to Rs.49,999/- or less may be deposited in cash in the Accounts Dept. of the Office where tenders are to be received.

APPENDIX TO CONDITIONS OF CONTRACT

TENDER FOR BUILDER'S WORK, WATER SUPPLY, SANITARY INSTALLATION, ELECTRICAL INSTALLATION AND OTHER ANCILLARY WORKS FOR CONSTRUCTION OF OFFICERS' QUARTERS BUILDING AT JAITARAN (RAJ.).

ESTIMATED COST : Rs. 92,31,350.50

PERIOD FOR COMPLETION : 09 Months

EARNEST MONEY DEPOSIT : Rs.1,38,500.00

Sl. No.	Clause Nos.	Description	Remarks
1 (a)	11	Minimum requirement of Technical staff ;	a) One Resident Engineer having a recognized Diploma in Civil Engineering with 2 years experience.
1 (b)	11	Recovery for Non Deployment of Engineer/s at the Site	a) Resident Engineer: Rs. 20,000 /- per month.
2	13	Date of commencement	1. Either 21(Twenty one) days from the date of acceptance letter issued to the contractor OR 2. The day on which contractor is instructed to take possession of the site, whichever is earlier
3	13 & 26	Date of completion	09 Months from the date of commencement
4	18.7	Reward for Early Completion	If the contractor completes the work 3 months in advance in all respects with respect to the final date of completion and the Chief Engineer certifies in writing that in his opinion the same has been completed, 0.5% of Final Contract Sum stipulated in the original contract shall be rewarded. If the contractor completes the works less than 3 months in advance in all respects with respect to the final date of completion and the Chief Engineer certifies in writing that in his opinion the same has been completed, 0.1% of Final Contract Sum stipulated in the original contract shall be rewarded.
5	19	Liquidated damages For contracts having time for completion (a) 6 months & less	Quantum of liquidated damages 1% of contract sum per week subject to a maximum of 10%.

		(b) exceeding 6 months	0.5% of contract sum per week subject to a maximum of 7.5%
6	21	Period of final measurement	60 (Sixty) days
7	22	Interim certificate	Monthly
8	22	Period of honouring interim certificate	20 (Twenty) days
9	22	Period of honouring final certificate	90 days from the date of submission of final measurements with details.
10	35	Security Deposit and Performance Guarantee :	a) Rs 4,61,600/- as Security Deposit only. b) Performance guarantee is required if tender amount is less than Rs 200 lakhs
11	35	Recovery of Security Deposit	In case of cash option, the EMD shall be retained as part of Security Deposit and balance Security Deposit shall be accumulated through deductions from Running Account Bills at 7.5% (maximum) of gross amount of bill. In case of Bank Guarantee option, the Contractor shall furnish one Bank Guarantee for full amount of Security deposit valid till end of defects liability period OR, Two Bank Guarantees of like amounts each equal to half the Security deposit; one valid till virtual completion and the other till end of defects liability period
11 a	35	Refund of EMD :	a) If the lowest tenderer withdraws his tender before the expiry of validity period or before the issue of Letter of Acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the department, then the department shall, without prejudice to any other right or remedy be at liberty to forfeit 25% of the Earnest Money absolutely and the balance Earnest Money will be refunded.
12	37	Interest on Lump sum Advance	10.00 % p.a. Simple Rate of Interest.
13	17.5	Contractor's All Risk Policy inclusive of Third Party Liability	a) For contract value upto Rs.2.00 crore – 7.5% of Tender Amount
14	17.6	Workman's Compensation Policy	As per mutual agreement.

15	17.9	Recovery for non Extension of Insurance Policies (Workman's Compensation and Contractor's All Risk Policy inclusive of Third Party Liability)	If not extended on time, LIC shall extend the Insurance policies on its own and apart from financial expenses, LIC shall deduct penalty amounting to Rs.10,000/- or double the premium amount whichever is more, for each extension of such policy.
16	27	Defect Liability Period	12 Months
17		Guarantee for Waterproofing and Anti-termite treatment	The guarantee for anti termite and waterproofing treatment starts from the date of Virtual Completion of the work till their relevant guarantee period expires.
18		Recovery of Water and / or Electricity Charges from Contractor's Bill.	0.50% of the Gross Value of work done if Water / Electricity from the Employers Source are used.
19	22.6	No Claim Certificate	To be given on Contractor's letter head

Note: **TAXES, DUTIES, LEVIES AND DEDUCTION AT SOURCE:**

- The contractor shall be responsible to pay all statutory levies imposed by the State and Central Government such as Income Tax, Sale Tax on works contract, Value Added Tax (VAT), Labour Cess, Excise Duty, Octroi and any other applicable taxes etc., and the rates quoted in the tender shall allow for the same.
- Liabilities towards Service Tax for Contractor and Employer shall be in accordance with relevant provisions of the Finance Act, 2012 or any amendment issued by concern Authority from time to time.
- Rates are inclusive all the taxes excluding Service Tax and contractors will be responsible for payment of applicable Service Tax (contractor's part) to concerned authority, which will be reimbursed to contractor on production of proof of, payment of Service Tax deposited.
- All the bidders are required to submit a copy of the Service Tax number provided by the Central Excise Department.
- Deduction at source of Income/Sales Tax on works contract, Labour Cess etc. shall be made by LIC of India as per the provisions prevailing from time to time from the Running Account or Final Bills and remitted to the concerned Taxation Authorities/ State Government on behalf of the contractor.
- This will supercede all provisions given in the tender elsewhere regarding Service tax.

NO CLAIM CERTIFICATE CUM RECEIPT

Received Rs. _____ (Rupees _____)
being the amount against my/our final bill dated _____ for _____ (Name of
Work) in full and final settlement of bill.

Contractor
(Signature of Contractor on Revenue stamp)
Rubber stamp/seal of the contractor /company

**LIFE INSURANCE CORPORATION OF INDIA
NORTHERN ZONAL OFFICE, NEW DELHI**

APPENDIX TO GENERAL INSTRUCTIONS TO CONTRACTORS**CLAUSE NO.2 :**

Name and Location of the Proposed work: CONSTRUCTION OF OFFICERS' QUARTER (3 NOS) AT JAITARAN (RAJ.)

CLAUSE NO.14 :

In addition to facilities, provided by the contractor under clause 14.1, in Office for Corporation's Engineer on Site, the contractor shall also provide computer with printer of suitable configuration as approved and directed by Site Engineer of Corporation.

SCOPE OF WORK :

Construction of Builder's Work, Interiors, Water Supply, Sanitary, Plumbing Work, Electrical Installation (Internal & External) including Ancillary Works, External Services works (pavement, Plinth protection, external drainage, water supply pumps, compound/ street light works), etc. as specified in Schedule Of Quantities.

SPECIAL CONDITIONS:

1. PHOTOGRAPHS OF THE BUILDING

- 1.1 The contractor shall submit 3 sets of the prints with soft copies of the photographs size 4"x6" to LIC of India on the following stages:
- a. Foundation work before plinth and back filling
 - b. Shuttering and reinforcement details floor wise before laying of concrete.
 - c. Completion stage of masonry work before plastering
 - d. After finishing but before painting
 - e. Completion before handing over the building.
- The photographs can also be submitted in CD/DVD.
- 1.2 One or more photographs shall be taken to have complete clear views of the project as directed by Corporation's Engineer. The further stage of work shall proceed only on confirmation of such photographs seen by LIC Engineers and a written site instructions obtained in this regard.
- 1.3 The quoted rates shall include for the same and no extra is payable to contractor on this account.

2. TESTING OF MATERIALS

During the progress of work, tests as prescribed below for various materials of construction shall be conducted as per the frequency noted in the table below. Contractor's attention is also drawn to Clause 9 of Conditions of Contract as well as Clause 9 of Preambles to Schedule of Quantities.

TABLE-A

Sl. No.	Materials	Test	Frequency
1.	Water	Chemicals & Physical properties for water	One test per source before commencement of work
2.	Sand (Fine Aggregates)	a) Slit content (field test) b) Gradation c) Bulking (Field test)	This is a routine test and should be carried out for sand for each consignment. Every 45 Cu.m or part thereof or whenever moisture content is doubtful.
3.	Stone (Coarse Aggregate)	a) Aggregate crushing value b) Gradation	One in beginning of stacking of materials thereafter for every change of source. Every consignment.
4	Cement	a) Initial & final setting time b) Compressive strength	One is being of stacking of materials thereafter for every change of source. One test for 100 tonnes or part there of and every changes of brand of cement if the cement is used for structural works.

Sl. No.	Materials	Test	Frequency
5.	Steel	1. Tensile strength a) Ultimate tensile stress b) Yield stress c) % Elongation	One test per category for every consignment used in work.
6.	Brick	a) Water absorption b) Efflorescence c) Compressive strength	One test for every 200000 Nos. or part thereof and for every change of brand (set of 5 bricks)
7.	Timber	a) Moisture content b) Specific gravity c) Species in sample of teak wood	One test for every 30cum or part thereof.
8.	Anodized coating of aluminum	Thickness of Anodic Coating.	One Test for material costing Rs.8.00 Lac.
9.	Marble mosaic tiles	a) Wet Transverse Strength b) Water Absorption c) Abrasion Test	One test for every 1 lakh tiles or part thereof.
10.	Flush Door	End Immersion Knife Adhesion	Destructive test based on no.of shutter. 1-100 one test 101-200 two test 201-500 three test 500 & above four test
11.	Ceramic Tiles/ Vitrified Tiles	Water absorption Crazing Test	One test for every 5000 nos. or part thereof.
12.	Marble	Moisture Absorption test	One test for every 800 sq.mt. or part thereof.
13.	Panel Door Shutter	a) Physical Test b) Glue Adhesion Test	One test from each lot. One test from each lot.
14.	Particle Board	a) Identification (Physical verification) b) Dimensional Tolerance	One test from each lot. One test from each lot.
15.	Sand Stone	Water absorption	One test from each lot.
16.	Cladding Stone	Water absorption	One test from each lot.

WATER

The Contractors shall be allowed use of water surplus to requirements of the Employer from existing wells or other source if any, on the site, but no guarantee is given that the quantity available shall be sufficient. In case, such water from the Employer's source is used, then water charges will be recovered from the Contractor's bill/s at the rate as mentioned in Sl.No 18 of "Appendix to the Conditions of Contract". The Contractor will make his own arrangements for plumbing and storing of water.

GENERAL PREAMBLES TO SCHEDULE OF QUANTITIES

These preambles apply to all the sections of the “Schedule of Quantities”.

1. RATE TO COVER :

- 1.1** The rates quoted by the contractor shall be held to include for providing and fixing, all conveyance and delivery, loading & unloading, carrying in, storing, hoisting, all labour, setting, fitting and fixing in position, making straight, cutting, waste, return of packing and all materials and labour and everything else necessary for the proper completion of each item of work to the approval of Corporation's Engineer and for Establishment Charges, overheads and profits. The Contractor shall provide at his expense all labour, materials and things required by the Corporation's Engineer for testing and measuring the work, for weighing, testing the efficiency of any portion of the work, all planking, gangways etc. necessary for affording access to every part of the work except where specifically stated otherwise.
- 1.2** The contractor should also cover in his rates for the method of work, cost of materials, labour etc., to comply with the “Trade Specifications”, General Instructions to Contractor”, “Conditions of Contract”, “Special Conditions”, (if any), and all documents of this contract.
- 1.3** All the materials or procedure or Specifications for work, unless otherwise stated, shall conform to the current Indian Standard whether or not specific mention is made thereof. The Contractor shall be responsible for and shall replace or make good at his own expense, any materials lost or damaged, or of quality not approved, temporarily disturbed roads, pavements, approaches, gates, walls or any such dismantling carried out to execute the work.
- 1.4** All rates quoted shall include for Supplying and fixing although the same may not have been mentioned in the item of the Schedule of Quantities. Words “Providing and Fixing where used shall have same meaning as “Supplying and Fixing”.
- 1.5** Rates quoted shall include for hoisting to any height, and all work at all levels and lift of materials shall not form any criterion for any extra claims, except where otherwise specified.

2. ANCILLARY WORKS :

- 2.1** The Contractor shall have to carry out all ancillary and connected work within and near vicinity of the plot of the proposed work and inside the Building if ordered to do so by the Chief Engineer at the rates given in the Schedule of Quantities, at any time during the currency of this Contract including extension of time, if any granted.

3. PRICE FLUCTUATION/VARIATION:

- 3.1** Rates quoted by the contractor shall be firm throughout the currency of the Contract including extensions of time, if any granted. No price adjustment due to variation in cost of materials or labour or any variation under any State or Central Legislation or any other reason whatsoever shall be allowed, except as stated in relevant clauses below with regard to variation in price on materials & labour and price fluctuation in Cement & Steel.

4. CEMENT :**CONTRACTOR'S QUOTED RATES:**

- 4.1** Contractor shall quote his overall Percentage Rates on the basis of provisions of this clause detailed hereunder and on the basis of the price of cement at site of work as mentioned in Annexure "P" attached herewith (hereinafter called the Basic Price of Cement).

APPROVAL OF SOURCE OF PURCHASE:

- 4.2** Contractor shall purchase cement from approved Cement Manufacturers/ such as ACC UltraTech, J. P. Rewa, Vikram, Shree Cement, Birla Jute, CCI, Madras cement, Chettinad cement, India cement etc. as approved by Ministry of Industry, Govt. of India and having license to use ISI Certification mark for their products and from C&F agents and authorized dealers (with dealership certificate). Cement shall be Ordinary Portland Cement 33 / 43 Grade of fresh manufacture conforming to IS: 269/ IS: 8112 respectively; Portland Pozzolana Cement: IS: 1489 (Part 2): 1991; Portland Slag Cement: IS: 455 (1989) or relevant Indian Standards (latest revision). Cement shall be purchased and transported to the work site by the contractor in bulk quantity required to achieve desired progress in next 3 months, from the above source of purchase (including brand of cement), At the time of starting the work, the request for approval shall be submitted within 15 days of receipt of tender acceptance letter. The contractor shall intimate the EE/SE the quantity of cement being procured, with the names, full addresses and telephone numbers of cement suppliers. For subsequent approvals the contractors shall approach Employer's Engineer at site at least 20 days in advance of the desired date of delivery of cement. The contractor shall submit his request for the approval through Employer's Engineer at site with one copy of the letter to EE/SE. The contractor's request letter shall mention the quantity of cement to be/ being purchased and also the quantity of cement in stock at site on the date of submitting the request.

BASIC PRICE OF CEMENT :

- 4.3** The Basic price of cement stated in Annexure "P" is inclusive of all costs up to the site of work, including purchase price, all levies and duties including excise duty, sales tax, Octroi / town duty, transportation charges including loading and unloading charges at all points (except unloading at site), transit insurance and any other expenses (expenditure) not mentioned above but

required etc., and shall be included by the contractor in his quoted rates. All other costs such as unloading the cement at site, handling, stacking, storage, providing watch and ward arrangements, loss due to pilferage, theft, damages if any including cement which may become unfit for consumption due to prolonged storage or due to rains etc. shall be to contractor's account and shall be included by the contractor in rates quoted in the tender.

QUALITY OF CEMENT :

- 4.4** The contractor shall satisfy himself that the cement arriving at site is ordinary port-land cement conforming to the requirement of IS: 269/8112 for 33/43 Grade respectively; Portland Pozzolana Cement: IS: 1489 (Part 2); Portland Slag Cement: IS: 455 (1989) or relevant Indian Standard and shall procure Manufacturer's Certificate to this effect. In case the contractor has any doubt regarding the quality of cement, it is up to him to have it tested at his own cost and make sure before incorporation in the works that the cement is of right quality. Each consignment of cement supplied should have Test Certificate of the Manufacturer.

4.5 CONTRACTOR'S OTHER RESPONSIBILITIES / LIABILITIES

- (i) Contractor shall comply with all requirements/procedures etc. that may be stipulated if any, by Government controlling authority from time to time and accordingly obtain the requisite supply of cement for the work.
- (ii) Even though the source of cement is approved by the employer but the employer shall not be responsible for quality of cement or any loss/ damage in transit, delays due to non-availability of cement with the factory/ C&F agents / authorized dealers and/or required transport etc. The contractor shall not be entitled to make any claim and EoT or Cost on the employer on such grounds.
- (iii) Cement shall be kept in custody of the contractor at site. The contractor shall be responsible for the safety of the cement by providing watch and ward as is necessary and directed. In case any cement is damaged, unaccounted for or lost due to pilferage or any other reason either in transit or at site, the accountability will be with contractor. If any quantity of cement is found in excess of requirement or left over after completion of the work, same shall not be removed from site without the written permission of the Engineer-in-charge.
- (iv) The contractor shall maintain a stock register at the site and shall record therein the receipt and consumption of cement, the same day it is received or consumed. He shall also get the entries in the register for receipt and consumption of cement countersigned by Employer's Site Engineer, on the same day cement is received or consumed.
- (v) Pozzolana/ Slag cement shall be used only if specifically permitted by the Chief Engineer. The Chief Engineer reserves the right not to allow the use of Pozzolana/ Slag cement. In case Pozzolana/ Slag cement is used, the

Contractor shall have to observe increased periods for striking form and additional period of one week for curing for which no claim shall be entertained.

- (vi) The cement shall be got tested by the Engineer-in-charge of employer as and when new consignment comes and there is change in manufacturer's brand. The contractor shall supply free of charge the cement required for testing including its transportation cost to testing laboratories. The cost of tests shall be borne by the contractor/Department in the manner indicated below:
 - (a) By the contractor, if the results show that the cement does not conform to relevant BIS codes.
 - (b) By the Department, if the results show that the cement conforms to relevant BIS codes.
- (vii) The contractor is allowed to use reasonable quantity from the cement brought at site for constructing temporary water storage tank to store water for construction, site office and godowns at site. The quantity used for this purpose shall not be accounted for payment due to price variation defined elsewhere.
- (viii) The actual issue and consumption of cement on work shall be regulated and proper accounts maintained. The theoretical consumption of cement shall be worked out as per procedure prescribed elsewhere in the contract. In case the cement consumption is less than theoretical consumption including permissible variation, recovery at the rate so prescribed shall be made. In case of excess consumption no adjustment shall be made.
- (ix) If the work executed is not conforming to acceptable standard as prescribed in the tender elsewhere, the work will not be considered for payment.

The damaged cement shall be removed from the site immediately by the contractor on receipt of a notice in writing from the Engineer-in-charge. If he does not do so within 3 days of receipt of such notice, the Engineer-in-charge shall get it removed at the cost of the contractor.

Chief Engineer may change the brand of Cement depending upon availability in local market, if needed. Instructions in this respect can be issued by them at regular intervals. The name of manufacturers will be finalized after taking into consideration the suggestions of contractors during pre bid meeting, if any.

Similar conditions for cement of other types like slag cement etc. may be incorporated wherever required by the authority by providing for relevant BIS Codes; suitable brands of cement and instructions issued by the department.

4.6 PAYMENT DUE TO VARIATION IN PRICES OF CEMENT

If after submission of the tender, the price of Cement specified in Annexure "P" increases/ decreases beyond the price(s) prevailing at the time of the last stipulated date for receipt of tenders including Tender opening extensions, if any for the work; then the variation in amount shall accordingly be paid and that any such variations shall be effected only for stipulated period of Contract including the justified contract period extended without imposition of liquidated clauses.

However for work done/during the justified period extended as above, it will be limited to indices prevailing at the time of stipulated date of completion or as prevailing for the period under consideration, whichever is less.

The increase/decrease in prices of cement, shall be determined by the Price indices as published by Economic Advisor to Government of India, Ministry of Commerce and Industry and base price for cement, as indicated in Annexure 'P' as valid on the last stipulated date of receipt of tender, including extension if any and for the period under consideration.

The amount will be worked out as per the formula given below for individual material :-

Adjustment for component of cement.

$$V = P \times Q \times \frac{CI - Clo}{Clo}$$

where,

V = Variation in Cement cost i.e, increase or decrease in the amount to be paid or recovered.

P = Base Price of cement as indicated in Annexure 'P' valid at the time of the last stipulated date of receipt of tender including extensions, if any.

Q = Quantity of Cement consumed in the works since previous bill.

Clo = All India Whole Sale Price Index for cement, as issued by Office of the Economic Advisor, Dept. of Industrial Policy & Promotion under Ministry of Commerce and Industry, Government of India as valid on the last stipulated date of receipt of tenders including extensions, if any.

CI = All India Whole Sale Price Index for cement, as issued by Office of the Economic Advisor, Dept. of Industrial Policy & Promotion under Ministry of Commerce and Industry, Government of India for period under consideration.

5. MILD STEEL BARS AND HIGH STRENGTH DEFORMED BARS FOR REINFORCEMENT IN R.C.C. WORK TO BE SUPPLIED BY CONTRACTORS :

5.1 CONTRACTOR'S QUOTED RATES:

Contractor shall quote his rates for various relevant items in the tender on the basis of provisions of this clause detailed hereunder and on the basis of the price of steel at site of work as mentioned in Annexure "P" attached herewith (hereinafter called the Basic Price of Steel).

5.2 APPROVAL OF SOURCE OF PURCHASE:

- (1) The contractor shall procure TMT bars of Fe415/ Fe500 grade (the grade to be procured is to be specified) from primary producers such as SAIL or TISCO or RINL as approved by Ministry of Steel. The TMT bars procured from primary producers shall conform to manufacturer's specifications. In case of non-availability of steel from primary producers, the approving authority may permit use of TMT reinforcement bars procured from secondary producers. In such cases following action is to be followed:
 - (a) The grade of the steel such as Fe415/Fe500 or other grade to be procured is to be specified as per BIS 1786/2008.
 - (b) The secondary producers must have valid BIS licence to produce HSD bars conforming to IS 1786: 2008. In addition to BIS licence, the secondary producer must have valid licence from either of the firms Tempcore, Thermex, Evcon Turbo & Turbo Quench to produce TMT Bars.
 - (c) The TMT bars procured from primary producers shall conform to manufacture's specifications.
 - (d) The TMT bars procured from secondary producers shall conform to the specifications as laid by Tempcore, Thermex, Evcon Turbo & Turbo Quench as the case may be.
 - (e) TMT bars procured either from primary producers or secondary producers, the specifications shall meet the provisions of IS 1786 : 2008/2012 pertaining to Fe415D or Fe 500D grade of steel as specified in the tender (while preparing Tender the grade of the steel to be specified).
- (2) The contractor shall have to obtain and furnish test certificates to the Engineer-in- charge in respect of all supplies of steel brought by him to the site of work.
- (3) Samples shall also be taken and got tested by the Engineer-in-Charge as per the provisions in this regard in relevant BIS codes. In case the test results indicate that the steel arranged by the contractor does not conform to the specifications as defined under para (1)(d) & (1)(e) above, the same shall stand rejected, and it shall be removed from the site of work by the

contractor at his cost within a week time or written orders from the Engineer-in-Charge to do so,

- (4) The steel reinforcement bars shall be brought to the site in bulk supply required to achieve desired progress of the work in next 3 months, from the above source of purchase (including brand of steel) as decided by the Engineer-in-charge. At the time of starting the work, the request for approval shall be submitted within 15 days of receipt of tender acceptance letter. The contractor shall intimate the EE/SE the quantity of steel being procured, with the names, full addresses, and telephone numbers of steel suppliers. For subsequent approvals the contractors shall approach Employer's Engineer at site **at least 20 days** in advance of the desired date of delivery of steel. The contractor shall submit his request for the approval through Employer's Engineer at site with one copy of the letter to EE/SE. The contractor's request letter shall mention the quantity of steel to be/ being purchased and also the quantity of steel in stock at site on the date of submitting the request.
- (5) The steel reinforcement bars shall be stored by the contractor at site of work in such a way as to prevent their distortion and corrosion, and nothing extra shall be paid on this account. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.
- (6) For checking nominal mass, tensile strength, bend test, re-bend test etc. specimens of sufficient length shall be cut from each size of the bar at random, and at frequency not less than that specified in the tender.

5.3 BASIC PRICE OF STEEL

The basic price of steel stated in Annexure 'P' is inclusive of all costs upto the site of work, including purchase price, all levies and duties including excise duty, sales tax, octroi / town duty, transportation charges including loading and unloading charges at all points (except unloading at site), transit insurance, and any other expenses (expenditure) not mentioned above but required etc. and shall be included by the contractor in his quoted rates. All other costs such as unloading the steel at site, handling, stacking, storage, providing watch and ward arrangements, loss due to pilferage, thefts or any other reasons shall also be to contractor's account and shall be included by the contractor in rates quoted in the tender.

5.4 QUALITY OF STEEL

The contractor shall satisfy himself that the steel arriving at site is TMT bars of Fe415/ Fe500 grade as per BIS 1786-2008/2012 or other grade bars procured either from primary producers or secondary producers, the specifications shall meet the provisions of IS 1786 : 2008/ 2012 pertaining to Fe 415D or Fe 500D grade of steel as specified in the tender and shall be supported by test certificate from the suppliers. In case the contractor has any doubt regarding the quality of steel, it is up to him to have it tested at his own cost and make sure before incorporation in the works that the steel is

of right quality. Each consignment of steel supplied should have Test Certificate of the Manufacturer.

5.5 CONTRACTOR'S OTHER RESPONSIBILITIES/ LIABILITIES

- (i) Contractor shall comply with all requirements/procedures etc. that may be stipulated if any, by Government/ controlling authority from time to time and accordingly obtain the requisite supply of steel for the work.
- (ii) Even if the source of steel is approved by the employer, the employer shall not be responsible for quality of steel, correctness of diameter/ size or any loss/ damage in transit, delays due non availability of steel with the manufacturer/suppliers and/or required transport etc. The contractor shall not be entitled to make any claim & Extension of Time or Cost on the employer on such grounds.
- (iii) The contractor shall be responsible for proper storing arrangement at site. Steel shall be kept in custody of the contractor at site. The contractor shall be responsible for the safety of the steel by providing watch and ward as is necessary and directed. In case any steel is damaged, unaccounted for or lost due to pilferage or any other reasons either in transit or at site, the accountability will be with contractor. If any quantity of steel is found in excess of requirement or left over after completion of the work, same shall not be removed site without the written permission of the Engineer-In-charge.
- (iv) The contractor shall maintain a stock register at the site and shall record therein the receipt and consumption of steel (category wise), the same day it is received or consumed. He shall also get the entries in the register for receipt and consumption of steel countersigned by Employer's Site Engineer, on the same day steel is received or consumed.
- (v) The wastage shall be to contractor's account and shall be taken away by the contractors after obtaining written permission from the Engineer-in-charge and the rates quoted shall allow for the same.
- (vi) The payment of steel reinforcement shall be made on weight worked out on the basis of measurement of lengths of various categories as incorporated in the work and sectional weights mentioned in tender.
- (vii) The contractor shall obtain a test certificate from the manufacturer for the lot of steel purchased for the work. The employer's site Engineer may also order testing of steel when new consignment comes and/ or there is change in manufacturer's brand, by the contractor before allowing its use in the work irrespective of the test certificate and in such case the contractor shall supply free of charge the steel required for testing including its transportation cost to testing laboratories, The cost of tests shall be borne by the contractor/Department in the manner indicated below but not any other incidental expenses for arranging the testing, which shall be to contractor's account and included in quoted rates.

- (a) By the contractor, if the results show that the steel does not conform to relevant BIS codes.
- (b) By the Department, if the results show that the steel conforms to relevant BIS codes.
- (viii) The actual issue and consumption of steel on work shall be regulated and proper accounts maintained. The theoretical consumption of steel shall be worked out as per procedure prescribed elsewhere in the contract. In case the steel consumption is less than theoretical consumption including permissible variation, recovery at the rate so prescribed shall be made. In case of excess consumption no adjustment shall be made.
- (ix) The substitution of any category of steel shown in drawing with other category of steel shall be done only if permitted by the EE/SE in writing.
- (x) The steel brought to site and the steel remaining unused shall not be removed from site without the written permission of the Engineer-in-charge.

5.6. Payment due to variation in prices of Steel

If after submission of the tender, the price of Steel specified in Annexure "P" increases/ decreases beyond the price(s) prevailing at the time of the last stipulated date for receipt of tenders including Tender opening extensions, if any for the work, then the variation in amount shall accordingly be paid and that any such variations shall be effected only for stipulated period of Contract including the justified contract period extended without imposition of liquidated clauses.

However, for work done/ during the justified period extended as above, it will be limited to indices prevailing at the time of stipulated date of completion or as prevailing for the period under consideration, whichever is less. The increase/ decrease in prices of steel, shall be determined by the Price indices as published by Economic Advisor to Government of India, Ministry of Steel and base price for steel, as indicated in Annexure 'P' as valid on the last stipulated date receipt of tender, including extension if any and for the period under consideration.

The amount will be worked out as per the formula given below for individual material:

Adjustment for component of steel,

$$V = P \times Q \times \frac{(C_1 - C_0)}{C_0}$$

where,

V = Variation in Steel cost i.e. increase or decrease in the amount to be paid or recovered.

P = Base Price of steel as indicated in Annexure 'P' valid at the time of the last stipulated date of receipt of tender including extensions, if any.

Q = Quantity of Steel consumed in the worksite i.e. as measured and recorded since previous bill. Wastage, if any, to be on contractor's account.

Clo = All India Whole Sale Price Index for steel, as issued by Office of the Economic Advisor, Dept. of Industrial Policy & Promotion under Ministry of Commerce and Industry, Government of India as valid on the last stipulated date of receipt of tenders including extensions, if any.

CI = All India Whole Sale Price Index for steel, as issued by Office of the Economic Advisor, Dept. of Industrial Policy & Promotion under Ministry of Commerce and Industry, Government of India for period under consideration.

6. WASTAGE OF CEMENT AND STEEL :

6.1 The wastage of Cement and Steel shall be to the contractor's Account and the rates quoted shall allow for the same.

7. BALANCE STOCK OF CEMENT/STEEL ON COMPLETION OF JOB :

7.1 Irrespective of what is mentioned anywhere else in this tender the surplus stock of Cement/Steel remaining at the site on completion of work, shall be the property of the Contractor. However, he shall remove the surplus stock only after furnishing the necessary details of such stock in writing to the Corporation's Engineer and obtaining permission from him.

8. STEEL OTHER THAN USED FOR REINFORCEMENT :

8.1 Rolled steel sections such as angles, joists, channels, flats etc. and mild steel used for M.S. Grills, railing, gates and M.S. Plates etc., shall be procured by the Contractor and Annexure "P" will not apply for cost of these items.

9. TESTING OF MATERIALS INCLUDING CEMENT AND STEEL :

9.1 Testing of all materials including cement & steel during the progress of work shall be as per frequency given in Table A, Clause 2 of Special Conditions.

9.2 Contractor shall facilitate testing of materials viz., Cement, Steel, Cubes and any other material as per the frequency / sampling mentioned in the Table 2 of the Special Conditions. Contractor shall also facilitate testing of any material to be incorporated in work even if it is not specifically mentioned. The testing charge against invoice shall be directly remitted by the corporation to the test house. If the material/s fails to conform to the standards, the test charges shall be recovered from contractor's bill.

- 9.3** For all other materials listed in Special Conditions, expenses towards testing shall be borne by LIC . If the material/s fails to conform to the standards, the test charges shall be recovered from contractor's bill.
- 9.4** The Corporation's Engineer may get tested any material to be incorporated in work even if it is not specifically mentioned. In all such cases, testing charges will be borne by LIC. If the material/s fails to conform to the standards, the test charges shall be recovered from contractor's bill.
- 9.5** For all tests incidental charges such as cutting, loading, unloading, casting wherever applicable such as mortar briquettes / cubes and facilitating in transportation, shall be borne by contractor.
- 10. "PRINCIPAL MAKE/S OR OTHER EQUAL AND APPROVED" FOR MATERIALS/ PRODUCTS :**
- 10.1** The Contractor shall note that materials having "ISI" monogram shall primarily be used in the work. If in the tender "Certain Principal Make / Makes or other equal and approved of any material/Product is mentioned in any item or Trade Preambles relating to the particular items in its respective Trade Schedule, the Contractor shall have to use the Principal Make/Makes specified in the relevant item or the trade Preambles. In case the specified particular Principal make/makes of the materials product is/are not readily available, the Contractor shall take prior permission and approval of the Chief Engineer in writing before use of the alternative equivalent make of the Material / Product.
- 10.2** All principal makes specified for any item shall be treated at par as per the accepted quoted rate.
- 10.3** Use of the make other than the Principal Make/Makes (which shall be treated as an Equivalent make) shall be at the discretion of the Chief Engineer and such Make/Makes shall be used after the approval of the Chief Engineer.
- 10.4** In such cases the Contractor will not be paid any extra payment over the accepted quoted rate in any case. However if it is ascertained that the price of approved Equivalent Make or the Material/Product is lower than that for the Principal Make/Makes of the same material/product the difference of the price shall be payable by the contractor to LIC. Such difference of price shall be suitably decided by the Chief Engineer whose decision shall be final and binding to the Contractor in this regard.
- 11. ADJUSTMENT IN PRICES OF MATERIALS AND LABOUR (OTHER THAN CEMENT & STEEL) :**
- 11.1** Adjustment in price of material, labour shall apply to original civil work for construction of building which may include piling, plumbing & sanitary work, electrical installations and which shall have a stipulated completion period of more than six months. The adjustment in prices under this clause shall not apply to works such as tube-well, lifts, air-conditioning, and substation

equipment, any other plant & machinery, interior work, repair & maintenance contracts unless otherwise specified.

- 11.2** Adjustment shall be made only for tender items and deviated items for the stipulated contract period.
- 11.3** Adjustment in prices of material & labour for the work executed within the stipulated scheduled date of completion shall be allowed on the basis of clause-11.7, 11.8, 11.9 and 11.10.
- 11.4** Adjustment in prices of material & labour for the work executed beyond the stipulated scheduled date of completion shall be allowed on the basis of clause-11.7, 11.8, 11.9 and 11.10, subject to the conditions given below.
- 11.5** (a) If the Contractor is granted Authorized Extension of Time beyond the Scheduled Date of Completion without imposition of Liquidated Damages then the Contractor shall be entitled for Adjustment for Variation in Prices of Labour and Material with prevailing index for the work executed during the extended period.
- (b) If the Contractor is granted Extension of Time beyond the Scheduled Date of Completion, but with imposition of Liquidated Damages then the Contractor shall be entitled for Adjustment for Variation in Prices of Labour and Material by considering index as that prevailing on the Scheduled Date of Completion or that prevailing on the date of billing, whichever is lower, for the work executed during the extended period.
- (c) If the Contractor is granted Extension of Time beyond the Scheduled Date of Completion and if the delay is due to the failure on the part of the contractor but, due to reasons beyond his control and Liquidated Damages are not imposed, then the Contractor shall not be entitled for Adjustment for Variation in Prices of Labour and Material for the work executed during the extended period.
- 11.6** For considering the value of adjustment for Price Variation of LABOUR/ MATERIALS during the extended period beyond stipulated date of completion as mentioned in the tender documents, the Average All India Whole Sale Price Index (W) for all commodities / All India Consumer Price Index for industrial workers shall be considered as detailed above.

ADJUSTMENT OF MATERIALS :

- 11.7** For the purpose of adjustment in price of materials, the component shall be 60% of the value of work done up to a given stage. While computing the adjustment, the cost of cement, steel or any other materials for which basic price has been stipulated in the tender shall be deducted from the component worked out at 60% of the value of work.

The cement and steel as covered under Clauses 4 and 5 of the General Preambles to schedule of quantities shall be excluded from the purview of the adjustment.

$$V_m = \left\{ 60/100 (R_n - R_{n-1}) - C_m - M_{n-1} + M_n \right\} \times \frac{(W - W_0)}{W_0}$$

Where,

V_m = Variation in price for materials i.e. increase or decrease in the amount in rupees to be paid or recovered.

R_n = Total value of work done (excluding prime cost items, extra items and advance on materials at site up to the period under reckoning) on the basis of accepted tender rates. The deviated items worked out fully on the basis of rates prevailing at the time of last date of receipt of tender to be included.

C_m = (C + S + Br) i.e. Total value of cement and steel at basic price stipulated in the tender and cost of items with Basic Rates fixed in schedule of Quantities and shall comprise of C & S and Br as explained below :

C = Cost of cement used in the work and recorded for any specific bill period under reference and worked out at basis price stipulated in Annexure "P" attached in the tender.

S = Cost of steel for reinforcement (covered under Clause 5.1 AND 5.2 of the General Preambles to schedule of quantities) used in the work and recorded for any specific bill period under reference and worked out at issue price / basis price stipulated in the tender.

Br = Cost of Material with Basic Rates fixed and mentioned with description of items in Schedule of Quantities, which shall be calculated by multiplying the quantity of material used in work by Basic Price of material mentioned in relevant tender item.

R_{n-1} = Total value of work done (excluding prime cost items, extra items and advance on materials at site) considered in the bill prior to the period under reckoning. The deviated items and such other items shall be considered as per R_n above.

M_n = Advance being allowed in the bill under consideration against materials at site (other than cement and steel)

M_{n-1} = Advance allowed in the bill prior to the period under scrutiny against materials at site (other than cement and steel)

W_0 = All India Wholesale Price Index for all commodities (Base = 100; Year 2004-05) as prevailing on the last day for submission of tender (including extended date, if any).

W = Average All India Wholesale Price Index for all commodities (Base = 100; year 2004-05); as published in the RBI Bulletin for the period of the bill under consideration viz. from the date of previous bill (date of commencement in case of first bill) to date of current bill (date of virtual completion in case of final bill or any earlier cut off date as fixed).

- 11.8** The adjustment on materials is worked out on the basis that material component in the building construction work is 60% of the value of work done, the rest being labour and profit. But in the initial stages of construction work, it might so happen that the cost of materials used exceeds 60% which is taken as an average and therefore adjustment gets worked out on negative side even though the economic index might have gone up. In such cases, the negative adjustment shall also have to be made in the bill.

ADJUSTMENT OF LABOUR :

- 11.9** The contractor shall pay wages to the skilled and unskilled labour not less than the rates prescribed under the minimum wages act and as stated in clauses no. 18 of the General Instructions to contractors for Builders work. Variation in prices of labour shall be worked out by applying the following formula and necessary payment/ recovery made :

$$V_L = 25/100 \times (R_n - R_{n-1}) \times (I - I_0) / I_0$$

V_L = Variation in price for labour i.e. increase or decrease in the amount in rupees to be paid or recovered.

I = Average All India Consumer Price Index for Industrial Workers (base 100 year - 2001) declared by Labour Bureau, Govt. of India, as published in Reserve Bank of India Bulletin during the period under reckoning.

Average All India consumer Price Index for Industrial workers for the period of the bill under consideration viz. from date of previous bill (date of commencement in case of first bill) to date of current bill (date of virtual completion in case of final bill or any earlier cut off date as fixed)

I_0 = All India Consumer Price Index for Industrial Workers (base 100 year- 2001) ruling on the last date of submission of tender (including extended date, if any)

R_n = As defined under 11.7 above

R_{n-1} = As defined under 11.7 above

- 11.10** If the last date for submission of tender / date of bill is between 1st to 15th of a particular month the relevant economic index (W , W_0 , I , I_0) for the previous month is to be considered. However, if the last date of submission of tender/

date of bill is between 16th and end of month, the relevant economic index for the month shall be reckoned while calculating the material/labour price adjustment.

- NOTE** :
- 1) The adjustment in prices of Materials and Labour shall be considered / effected only when the Contractor submits authentic data for prevailing indices along with the RA/Final Bill. The Employer reserves the right to set aside certain amount from the Bill if the Contractor does not submit the authentic data of prevailing indices along with the bill.
 - 2) For adjustment in prices of materials & labour the indices (WPI/CPI) published by RBI as mentioned above which are available as on the date of submission of final bill (final / provisional indices) will only be considered for settlement of final bill. No further review will be done, even if there are variations in indices (WPI/CPI) after the final bill is settled.
 - 3) In case during the period of contract, the base years for publishing Economic Indices are changed as per statute, then the revised indices will be considered as per the published data available at the time of setting the bill/s.

Name of the work:

Annexure M-1

Abstract Bill No.

TI No.	Tender Qty.	Brief Description	Quantity			Unit	Rate	Amount (Rs.)
			Last Bill	This Bill	Actual Total			
1.01								
1.02								
1.03								

Deviated items :

Net value after rebate :

Value Extra items

Value escalation on material

Value escalation on labour

Value escalation on Cement

Value escalation on Steel

Total value of work done :

Advance for material at site

Any miscellaneous reimbursement charges, cube testing charges.

Devaluation if any

Total value of Work done Rs.

Deductions

IT on value of Work Done

WCT @% on value of work done

Labour Cess @% on value of work done

Cement consumed in the work

RMD

Recovery of any other material if any

Recovery of waterproofing items

Recovery of electricity

Recovery of Insurance lapses & liquidity damages

Amount released in earlier Bills

Total recoveries

Net Amount Payable Rs.

ANNEXURE “P”

1. BASIC PRICE OF CEMENT at the Work-Site.
(Refer Clause No. 4.3 of the General Preambles to Schedule of Quantities).

Rates as given in schedule of quantities shall be Based on the BASIC PRICE of Cement at the work-site which includes purchase price of Cement, all Levies and duties such as Excise Duty, Sales Tax, Octroi/Town duty, Transportation charges from the factory / C&F Agent godown to the work – site, loading and unloading charges at all points (except unloading at the work – site), transit insurance etc.

A) Ordinary Portland Cement : Rs.5300.00 PER M.T. (RS. FIVE THOUSAND THREE HUNDRED ONLY) PER M.T.

2. BASIC PRICE OF STEEL at the Work – Site :
(Refer clause No. 5.3 of the General Preambles of Schedule of Quantities)

Rates as given in schedule of quantities shall be based on the BASIC PRICE of Steel at the Work-Site which includes purchase price of Steel, all Levies and Duties such as Excise Duty, Sales Tax, Octroi/Town Duty, Transportation Charges from the manufacturer godown to the work-site including bending and binding charges at all points (except unloading at the work-site), Transit Insurance, Weighment charges, etc.

A) TMT/ High Strength Deformed Bars manufactured by Primary Producers of all diameters in coil or in straight lengths	Rs. 37,000.00 PER M.T. (Rs. Thirty Seven Thousand Only) PER M.T.
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Note :

1. The increase/ decrease in prices of Cement and Steel shall be determined by the All India Whole Sale Price Index for Cement and Steel, as issued by Office of Economic Adviser, Dept. of Industrial Policy and Promotion under Ministry of Commerce and Industry, Government of India as per the formula given in the Tender.
2. Packing of Cement (like gunny bags, polythene bags etc.) cost of which is included in the purchase price, shall BE THE PROPERTY OF THE CONTRACTOR.

ANNEXURE “Q”**NOTE REGARDING STATEMENT SHOWING QUANTITIES OF THEORETICAL
CONSUMPTION OF CEMENT FOR MAJOR ITEMS OF WORKS**

NOTE: Refer to the latest CPWD specification and norms for Coefficient of Cement Consumption. In case no Coefficient is available for a specific item the decision of Chief Engineer, shall be final and binding on the contractor.

ANNEXURE – “R”**LIFE INSURANCE CORPORATION OF INDIA****FORM OF GUARANTEE FOR WATERPROOFING**

(To be given by Waterproofing Agency)

Name of the work : _____

Name of the Main contractor : _____

Name of Water Proofing Agency

M/s. _____

We M/s. _____

_____ hereby guarantee that the surfaces treated by us for waterproofing in the above work, for M/s. _____ the General builders Contractors for the above work, shall remain entirely watertight, Should, however, due to any unforeseen defect left out in the work carried out by us at the time of execution of the work, there be any leakage from any surface treated by us during the period of **ten years** from the date of virtual completion of work i.e. from _____ to _____ the same shall be rectified by us without any cost to the Life Insurance Corporation of India.

However, we shall not be responsible in any way if our work is tampered with or if the body of the structure is damaged due to sinking, cracking and/or by any other act of God.

The intimation received from LIC of India during Guarantee period shall be deemed to have been received from Main Builder's Contractor and inspection as well as necessary work shall be carried out and reported upon by us forthwith.

Signature of Waterproofing Agency**Signature of the Main Builders' Contractor**

ANNEXURE - "T "**(PROFORMA OF GUARANTEE FOR ANTI-TERMITE TREATMENT)**
(To be given on stamp paper of Rs. 10/-)

Name of the firm/Company & its address :-

To,

The L.I.C. of India,

Dear Sirs,

Sub:- Pest control – Pre construction anti termite treatment
Treatment – Guarantee regarding _____

We hereby certify that the foundation's and structure/s of the premises of the Life Insurance Corporation of India described in the schedule below, have been pre-treated by us against subterranean termite infestation in accordance with our procedure for pre-treatment set out in our letter/s No..... dated..... And in accordance with the terms and conditions under which the said works are carried out.

2. We hereby guarantee that the foundation/s structure/s of the said premises of the L.I.C. of India, shall be safe against subterranean or infestation for a period of 5 years from
To..... (FIVE)

3. In the event of said structure/s and foundations of the premises of the L.I.C. of India being or becoming subject to subterranean termite attack or infestation at any time during the guaranteed period of 5 years, we agree to carry out as often as it becomes necessary, at our cost and expenses all and every treatment that may be necessary to render the said foundation/s and structure/s free from such subterranean termite attack or infestation.

3. The question whether the foundation/s and structure/s of the premises are or become subject to subterranean termite attack or infestation and whether any anti termite is or has become necessary shall be decided by the L.I.C. of India and we agree that their decision in this regard shall be final and binding on us.

Yours faithfully,

Signature of specialized
Agency / firm with seal.

Signature of Bldg. Contractor who have done the Builder's work.

ANNEXURE – ‘E’**PROFORMA OF BANK GUARANTEE IN LIEU OF EARNEST MONEY DEPOSIT**

(Refer clause 10 of Instructions in regard to Submission of Tenders in Part -II)

(On Non-Judicial Stamp Paper to be stamped in accordance with stamp act, the stamp paper to be the name Executing Bank)

Ref:

Date:

Bank Guarantee

No.....

To

THE LIFE INSURANCE CORPORATION OF INDIA

Dear Sir,

In consideration of Life Insurance Corporation of India having its Zonal Office at New Delhi in state of Delhi (Herein after called the “the Corporation” which expression shall unless repugnant to be the subject or context include its successors and assigns) having issued Direct Tender Notice for the work of

M/s.....

Having its Registered / Head Office at

(Herein after called the “Tenderer” who wishes to participate in the said tender for

And you, have agreed to accept an irrevocable and unconditional Bank Bid Guarantee for the and amount of Rs.....

(Rupees..... valid up to on behalf of the tenderer in lieu of Earnest Money Deposit required to be made by the tenderer, as a condition precedent for participation in said tender.

We, the Bank incorporated under law and having one of our branches at and having our Registered Office/ Head office at do hereby unconditionally and irrevocable guarantee and undertake to pay to the “Employer” immediately on demand without any demur reservation, protest, contest and recourse to be extent of the said sum of Rs.....(Rupees only).

Any such claim/ demand made by the said “Employer” on us shall be conclusive and binding on us irrespective of any dispute or difference raised by the tenderer. This guarantee shall be irrevocable and shall remain valid up to If any further extension of this guarantee is required, the same shall be granted to such required period on receiving instructions from M/s to whose behalf this guarantee is issued.

We, the said Bank undertake not to revoke this guarantee during its currency except with the previous consent of the employer in writing and agree that any change in the constitution of the said tenderer or the said Bank shall not discharge our liability hereunder. In witness whereof the Bank, through its authorized officer, has set its hand and stamp on this day of 20 at

WITNESS

1. (SIGNATURE)
(NAME).....

(SIGNATURE)
(NAME).....
(Designation with Bank Stamp)

(OFFICIAL ADDRESS)
.....
.....

ATTORNEY AS PER
POWER OF ATTORNEY NO.....
DATE.....

2. (SIGNATURE)
(NAME).....

(OFFICIAL ADDRESS)
.....
.....

ANNEXURE – 'I'**PRE CONTRACT INTEGRITY PACT****General:**

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on..... day of the month of201 , between, on one hand, the Life Insurance Corporation of India (hereinafter referred to as "LIC") a statutory Corporation established under section 3 of Life Insurance Corporation Act 1956 (XXXI of 1956) and having its corporate office at "Yogakshema" Jeevan Bima Marg Mumbai 400021. (hereinafter called the "BUYER" which expression shall mean and include, unless the context otherwise requires, his successors in office assigns) of the First part. And M/s represented by Shri..... .(hereinafter called the "BIDDER /SELLER" which expression shall mean and include , unless the context otherwise requires, his successors and permitted assigns) of the Second part.

WHEREAS the BUYER proposes to **Construct the OFFICERS' QUARTERS BUILDINGat JAITARAN (RAJ.)** and the BIDDER/Seller is willing to offer/has offered to **Construct the OFFICERS' QUARTERS BUILDINGat JAITARAN (RAJ.)** and

WHEREAS the BIDDER is a private company/public company/Government undertaking/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is performing its function under the LIC Act 1956.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

Enabling the BUYER to **Construct the OFFICERS' QUARTERS BUILDINGat JAITARAN (RAJ.)** at a competition price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERS to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and

the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:-

Commitments of the BUYER

- 1.1** The BUYER undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER, either themselves or for any person, organisation or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting on implementation process related to the contract.
- 1.2** The BUYER will, during the pre-contract stage, treat all BIDDERS alike and will provide to all BIDDERS the same information and will not provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERS.
- 1.3** All the officials of the BUYER will report to the appropriate "CVO" any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

2. In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER with full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

Commitments of BIDDERS

3. The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the

contract or in furtherance to secure it and in particular commit itself to the following:-

- 3.1** The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.
- 3.2** The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract of any other contract with the government for showing or forbearing to show favour or disfavor to any person in relation to the contract of any other contract with the Government.
- 3.3** Foreign BIDDERS shall disclose the name and address of their Indian agents and representatives in India, and Indian BIDDERS shall disclose their foreign BUYERS or associates.
- 3.4** BIDDERS shall disclose the payments to be made by them to their agents/brokers or any other intermediary, in connection with this bid/contract.
- 3.5** The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacturer/ integrator/authorized agent of the stores/equipment/items and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

3.6 The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.

3.7 The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

3.8 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

3.9 The BIDDER/Contractor will not commit any offence under the relevant India penal code (IPC) /Provision of corruption (PC) act .Further improperly , for purposes of competition or personal gain, pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.

3.10 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

3.11 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

3.12 If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filing of tender.

The term 'relative' for this purpose would be as defined in section 6 of the Companies Act 1956.

3.13 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee or the BUYER.

4. Previous Transgression

4.1 The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify; BIDDER's exclusion from the tender process.

4.2 The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. Earnest Money (Security Deposit):

5.1 While submitting commercial bid, the BIDDER shall deposit an amount Rs..... (to be specified in RFP/Tender) as Earnest Money as applicable/Security Deposit, with the BUYER through any of the following instruments:

- (i) Bank Draft of Pay Order in favour of LIC.
- (ii) A confirmed guarantee by an Indian Nationalized Bank, promising payment of the guaranteed sum to the BUYER on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the BUYER shall be treated as conclusive proof of payment.
- (iii) Any other mode or through any other instrument (to be specified in the RFP/Tender).

5.2 The Earnest Money /Security Deposit shall be valid up to the complete conclusion of the contractual obligations to the complete satisfaction of both the BIDDER and the BUYER, including warranty period, which ever is later.

5.3 In case of the successful BIDDER a clause would also be incorporated in the Article pertaining to Performance Bond in the Purchase Contract that the provisions of sanctions for Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the BUYER to

forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

5.4 No interest shall be payable by the BUYER to the BIDDER on Earnest Money/Security Deposit for the period of its currency.

6. Sanctions for Violations:

6.1 Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required:-

(i) To immediately call off the pre contract negotiations without assigning any reason or giving any; compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would continue.

(ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/ Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.

(iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

(iv) To recover all sums already paid by the BUYER, and in the case of an Indian BIDDER with interest thereon at 2% above the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2% above the LIBOR (London Inter Bank Offer Rate). If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.

(v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.

(vi) To cancel all or any other contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/recission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.

(vii) To debar the BIDDER from participating in the future bidding processes of LIC for a minimum period of five years which may be further extended at the discretion of the BUYER.

(viii) To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.

(ix) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.

(x) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this pact.

6.2 The BUYER will be entitled to take all or any of the actions mentioned at para 6.1(i) to (x) of this pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

6.3 The decision of the BUYER to the effect that a breach of the provisions of this pact has been committed by the BIDDER shall be final and convulsive on the BIDDER. However, the BIDDER can approach the Independent Monitor(s) appointed for the purposes of this Pact.

7. Fall Clause:

7.1 The BIDDER undertakes that it has not supplied/is not supplying similar product/systems/items or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or subsystems/items was supplied by the BIDDER to any other Ministry/Department of the Government of India or PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the BIDDER to the BUYER, if the contract has already been concluded.

8. Independent Monitors:

8.1 The BUYER has appointed (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission.

Name address of the Monitor(s):

✱

✱

8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

8.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently. It will be obligatory for him to treat the information & documents of the Bidder /Contractor as confidential.

8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

8.5 As soon as the Monitor notices, or has reason to believe, a violation of this pact, he will so inform the Authority designated** by the BUYER.

8.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

8.7 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8.8 The Monitor will submit a written report to the designated authority** of BUYER /Secretary in the Department/ within 8 to 10 weeks from the date of reference or intimation to him by the BUYER /BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

9. Facilitation of Investigation:

In case of any allegation of violation of any provisions of this pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER. The BIDDER shall provide necessary information and documents in English and shall extend all possible help of the purpose of such examination/inspection.

10. Law and Place of Jurisdiction:

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the BUYER.

11. Other Legal Actions:

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extent law in force relating to any civil or criminal proceedings.

12 Validity:

12.1 The validity of this Integrity Pact shall be from date of its signing and extend upto 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

12.2 Should one or several provisions of this Pact turn out to be invalid; the remainder of this pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13. The parties hereby sign this Integrity Pact at.....on.....

BUYER **LIC of India**

BIDDER

Name of the Officer:

CEO

Designation : **Chief Engineer**

Deptt./MINISTRY/PSU : **Engineering Department**

NZO, New Delhi

Witness

1.....

1.....

2.....

2.....

(* Provisions of these clauses would need to be amended/deleted in line with the policy of the BUYER in regard to involvement of Indian agents of foreign suppliers.)

(** Please specify the "Name of Authority" in place of "Authority Designated" wherever mentioned in the Agreement)

Note: The name of monitor(s) shall be intimated separately for your information as the same is not available with us at present.

LIST OF PRINCIPAL MAKES / AGENCIES / BRANDS OF VARIOUS MATERIALS

1. Materials used in the work should be from the following list of principal makes/ brands. In case of non-availability of these makes/brands, Chief Engineer shall allow materials licensed by BIS bearing "ISI" monogram at par with principal makes.
2. For all other manufactured materials for which principal makes are not mentioned the materials allowed to be used in the work shall have BIS certification and samples for which are to be got approved prior to use of the same in the work.
3. For some materials BIS certification may not be available. In such cases the samples shall have to be got approved before using in the work.

Sl. No	MAKES / AGENCIES / BRANDS	Sl. No.	MAKES / AGENCIES / BRANDS
1.	Ordinary Portland Cement/ Pozzolana Portland Cement	2.	Reinforcement Steel – (Primary Producers)
	ACC		RINL
	Ultratech		SAIL
	Vikram		TATA STEEL Ltd.
	Shree Cement		
	Birla Jute		
	J. P. Rewa		
	CCI		
	Madras Cement		
	India Cement		
	Chettinad		
3.	GI PIPES	4.	GI PIPE FITTINGS
	a. Jindal		a. R-Brand
	b. Zenith		b. K.S.Brand
	c. Apollo		c. Zoloto
	d. GST		d. RR
	e. Prakash		e. SSS
	f. QST		f. NMC
5.	COPPER PIPES / TUBES	6.	MULTI LAYER COMPOSITE PIPES
	a. Rajco Metal Industries		a. Ki TEC
	b. B.P.Conex		b. Kisan
	c. Comap		c. Flowguard CPVC Astral
7.	PVC PIPES AND FITTINGS	8.	UPVC (UNPLASTICIZED PIPES & FITTINGS)
	a. Chemplast		a. Prince
	b. Prince		b. Supreme
	c. Supreme		c. Paras
	d. Finolex		
	e. Oriplast		

Sl. No	MAKES / AGENCIES / BRANDS	Sl. No.	MAKES / AGENCIES / BRANDS
9.	GATE VALVES, GLOBE VALVES	10.	FOOT VALVES , CHECK VALVES
	a. Leader		a. Kirloskar
	b. Kirloskar		b. Leader
	c. Zoloto		c. Ashoka
	d. Orient		
11.	WATER METERS	12.	FERRULES
	a. Capstan		a. Leader
	b. Anandaasahi		b. Hindco
	c. Dasmesh		c. Neta
	d. Remco		d. Annapurna
13.	BIB COCKS, STOP COCKS, PILLAR TAPS ETC.	14.	LOW LEVEL FLUSHING CISTERNS (PVC / CERAMIC)
	a. Jaguar (Continental Series)		a. Parryware
	b. Marc (Oriental Series)		b. Cera
	c. Essco		c. Hindware
	d. ARK		d. Commander
	e. GEM		
15.	VITREOUS SANITARY WARE LIKE IWC, WASH BASIN, URINALS, EWC ETC.	16.	PLASTIC SEAT AND COVER
	a. Parryware		a. Commander
	b. Cera		b. Parryware
	c. Hindware		c. Bestolite
	d. Neycer		d. Duroshine
17.	BATHROOM FITTINGS	18.	CI PIPES & FITTINGS
	a. Jaguar (Continental Series)		a. Hind
	b. ESSCO		b. BIS
	c. Gem		c. BIC
	d. ARK		d. NECO
	e. Marc (Oriental Series)		
19.	CI NAHANI TRAP	20.	SW PIPE
	a. BIC		a. HIND
	b. SKF		b. PERFECT
	c. NECO		c. BURNS
	d. RAJCO		

Sl. No	MAKES / AGENCIES / BRANDS	Sl. No.	MAKES / AGENCIES / BRANDS
21. PVC CABINET MIRROR		22. SLUICE VALVE	
a. Commander		a. Leader	
		b. Kirloskar	
23. HDPE / LDPE / LLDPE WATER STORAGE TANKS		24. CERAMIC / GLAZED TILES	
a. Sintex		a. Nitco	
b. Polycon		b. Kajaria	
c. G&P		c. Euro	
		d. H. R. Johnson	
		e. SOMANY	
25. VITRIFIED TILES		26. PLY WOOD(BWR) BLOCK BOARD	
a. Nitco		a. Kitply	
b. Kajaria		b. Archid	
c. RAK		c. Green Ply	
d. EURO		d. Century Ply	
e. SOMANY		e. Bhutan Board	
		f. Sharon	
		g. Anchor	
		h. Swastik	
		i. National	
27. FLOAT GLASS		28. PVC DOORS & DOOR FRAMES	
a. Saint Gobain		a. Rajshri	
b. Modi Guard		b. Sintex	
c. Triveni Sheet Glass		c. Supreme	
d. Indo Asahi Glass Co.			
e. Tata			
f. Atul			
29. ALUMINIUM EXTRUDED SECTIONS		30. STAINLESS STEEL KITCHEN SINKS	
a. Hindal		a. Nirali	
b. Jindal		b. Farnkee	
c. Indal		c. Jayna	
d. Hindalco		d. Diamond	
		e. Neelkanth	

31. PRE - LAMINATED / VENEERED PARTICLE BOARD	32. FLUSH DOOR SHUTTERS
a. Novopan	a. Kuttly Flush Doors
b. Green Lam	b. Century
c. Kitlam	c. Green Ply
d. Archid Lam	d. Shiva Hari Ply wood Ltd. (Corbett)
e. Swastik	e. Anchor Ply
	f. Swastik Ply
	g. Western India
	h. Parvathi Wood
33. DECORATIVE LAMINATES	34. FLOOR SPRINGS
a. Green Lam	a. Everite
b. Merino	b. Hardwyn
c. Sunmica / Formica	c. Efficient Gadgets
d. Century	d. Garness
e. Durian	e. Dormer
f. Sundek	
g. Anchor	
h. Decolam	
35. VENEERS	36. MDF BOARDS
a. Decowood	a. Duratuff
b. Euro Veneers	b. Nuwud
c. Durian	c. Century
d. Green Lam	d. Novopan
	e. Kitply
	f. Green Ply
37. ADHESIVES	38. WOOD PRESERVATIVES
a. Fevicol-SH	a. Bison
b. Araldite	b. Godrej
c. Ciba Giegy	c. Kot
d. Mowool -HV of Mafatlal	
39. HARDWARE FITTINGS	40. DOOR CLOSERS
a. Jyoti	a. Everite
b. Argent	b. Hardwyn
c. C.I.E.F.	c. Efficient Gadgets
d. Classic	d. Ebco
e. Everite	e. Dorma
f. Metaco India	f. Garness
g. JH Alumium	
h. PV Radhakrishna	
i. Etalia	
j. Hardwin	

Sl. No	MAKES / AGENCIES / BRANDS	Sl. No.	MAKES / AGENCIES / BRANDS
41.	DRAWER SLIDERS	42.	LOCKS
	a. Efficient Gadgets		a. Godrej
	b. EBCO		b. Golden
	c. Etahoa		c. Efficient Gadgets
	d. Sisco		d. Mark
			e. Sheet
			f. Vision
			g. Dorma
43.	MIRRORS	44.	WATER PROOFING COMPOUND
	a. Atul		a. Impermo
	b. Sun		b. Cico
	c. Commander		c. Pidilite
	d. Saint Gobain		d. Roff
	e. Globe		e. Choksey
	f. Modi Guard		f. Hindustan Ciba Gaigey
			g. Accoproof
			h. Sika
			i. Fosroc
45.	STEEL WINDOWS AND VENTILATORS	46.	AC PIPES / SHEETS
	a. Agew Steel Mfg Co. Ltd.		a. Charminar
	b. Sen Harvic		b. Everest
	c. Hopes		c. Visakha
	d. Diana Casements		d. Orient
	e. Madhu Industries Bangalore		e. Ramson
	f. Mulltiwin Unique Metal Windows		
	g. Ankur Industries		
	h. Modern Fabricators		
47.	SPECIAL PROTECTIVE & DECORATIVE FINISH	48.	OIL BOUND DISTEMPER
	a. Snowcem Paints		a. Asian
	b. Asian Paints		b. Berger
	c. Berger		c. Jenson & Nicholson
	d. Jenson & Nicholson		d. ICI
	e. Kansai- Nerolac		e. Kansai-Nerolac
	f. ICI		f. Godawari
	g. Godawari		

Sl. No	MAKES / AGENCIES / BRANDS	Sl. No.	MAKES / AGENCIES / BRANDS
49. CEMENT PAINT		50. SURFACE TEXTURE	
	a. Snowcem Plus		a. Heritage (Bakelite Hylam Ltd.)
	b. Berger		b. Spectrum
	c. Asian		
	d. Jenson & Nicholson		
	e. Kansai – Nerolac		
	f. ICI		
	g. Godawari		
51. TEXTURED PAINT		52. ENAMEL PAINT / PRIMERS / READY MIXED PUTTY FOR WOOD WORK, IRON & STEEL	
	a. Snowcem India Ltd.-Sandtex matt		a. Asian
	b. Asian		b. Berger
	c. Jenson & Nicholson		c. Jenson & Nicholson
	d. Berger		d. Kansai – Nerolac
	e. Kansai – Nerolac		e. ICI
			f. MRF
			g. Godawari
53. WALL PUTTY		54. EXTERIOR EMULSION	
	a. Birla wall care		a. Asian Paints-Apex
	b. Snowcem paints		b. Berger Paints
	c. JK		c. Kansai – Nerolac
	d. Asian Paints		d. MRF
			e. Jenson & Nicholson
			f. ICI
			g. Godawari
55. CEMENT CONCRETE PIPES		56. EXPANSION JOINT BOARD	
	a. The Indian Hume Pipe		a. Shalimar Tar Products
	b. Premiere Pre-stressed Co.		b. Lloyds insulations
			c. Fosroc
			d. Shalitex
57. FALSE CEILING		58. VERTICAL BLINDS	
	a. Indian Gypsum		a. Vista Levlor
	b. Armstrong		b. Trac
	c. Daikin		c. Mac
	d. QED Panels		d. MARVEL
	e. Insula		

Sl. No	MAKES / AGENCIES / BRANDS	Sl. No.	MAKES / AGENCIES / BRANDS
59. ADHESIVE FOR TILE FIXING		60. PAVING TILES	
a. Roffe		a. Eurocon	
b. Bal Endura		b. Ultra	
c. Cera Bond		c. Duracrete	
d. Fosroc			
e. Choksey Chemicals			
f. Dr.Fixit			
g. Sika			
h. Sunanda			
61. PVC FLOORING		62. VINYL FLEXIBLE FLOORING	
a. Flora		a. Wonder Floor	
b. Armstrong		b. Armstrong	
		c. BHOR	
		d. Rikvin	
		e. Tusker	
63. FIBRE GLASS DOORS		64. SS / CP FRICTION HINGES	
a. Master craft		a. Ebco	
		b. Jyoti	
		c. Everest	
		d. Magnum	
65. SOFT BOARD		66. SCREW	
a. Jolly Board		a. Nettlefold	
		b. GKW	
67. FIBRE REINFORCED COMP.DOOR			
a. Loknath Unique			

APPROVED MAKE OF MATERIALS LIST FOR ELECTRICAL WORKS.

SL. NO.	MAKES/AGENCIES/BRANDS	SL. NO.	MAKES/AGENCIES/BRANDS
1.	COPPER CONDUCTOR PVC INSULATED FR, 1.1 KV GRADE WIRE/CABLE.	2.	PVC/XLPE INSULATED ALUMINUM/ CONDUCTOR CABLE (HT/ LT). COPPER ARMoured
	1) FINOLEX 2) HAVELLS 3) RR CABLES 4) V GAURD		1) FINOLEX 2) FORT GLOSTER 3) CCI 4) RR KABLE 5) DELTON
3.	MAIN SWITCH WITH HRC FUSES.	4.	MAIN SWITCH WITH REWIREABLE FUSES.
	1) L&T 2) SIEMENS 3) GE 4) ENGLISH ELECTRIC 5) HAVELLS 6) STANDARD		1) L&T 2) CROMPTON GREAVES 3) HAVELLS 4) STANDARD
5.	MCCB	6.	MCB/ELCB/ELMCB/DB
	1) LEGRAND 2) SCHNIDER ELECTRIC 3) L&T 4) SIEMENS		1) LEGRAND 2) SCHNIDER ELECTRIC 3) HAGGER 4) SIEMENS
7.	CHANGE OVER SWITCH/ SWITCH FUSE UNIT UP TO 100 AMP.	8.	CHANGE OVER SWITCH/ SWITCH FUSE UNIT ABOVE 100 AMP.
	1) L&T 2) HAVELLS 3) SIEMENS 4) HPL 5) STANDARD		1) L&T 2) SIEMENS 3) HPL

SL. NO.	MAKES/AGENCIES/BRANDS	SL. NO.	MAKES/AGENCIES/BRANDS
9.	RISING MAINS	10.	PVC CONDUIT & ACCESSORIES. (ISI MARKED)
	1) ENGLISH ELECTRIC 1) GEC 2) SCHNIDER ELECTRIC		1) PRECEISION 2) AVON PLAST 3) ESSARKE 4) SUDHAKAR 5) KALINGA 6) AKG
11.	PVC CASSING CAPPING (ISI MARKED)	12.	M.S. CONDUIT & ACCESSORIES.
	1) PRECEISION 2) SUDHAKAR 3) KALINGA 4) AKG 5) DIAMOND		1) SUPREME 2) BIC 3) NIC 4) AKG
13.	FLOOR TRUNKING SYSTEM	14.	G.I. PIPE
	1) LEGRAND 2) MK ELECTRIC 3) PRECEISION 4) MODI		1) TATA 2) JINDAL 3) SENITH 4) PRAKASH 5) GST 6) APOLLO
15.	MODULAR SWITCHES, ACCESSORIES & ELECTRONIC REGULATOR	16.	NON MODULAR SWITCHES ,ACCESSORIES & ELECTRONIC REGULATOR
	1) ANCHOR ROMA 2) SSK 3) LEADER 4) CRABTREE 5) MK		1) ANCHOR 2) LEADER 3) SSK 4) CPL
17.	INDUSTRIAL PLUG & SOCKETS.	18.	CEILING/ EXHAUST/ WALL FAN
	1) LEGRAND 2) HAGER 3) HAVELLS 4) CROMPTON GREAVES 5) STANDARD		1) USHA 2) BAJAJ 3) CROMPTON GREAVES 4) ORIENT 5) ALMONARD

SL. NO.	MAKES/AGENCIES/BRANDS	SL. NO.	MAKES/AGENCIES/BRANDS
19.	INDOOR LIGHT FITTINGS	20.	OUTDOOR LIGHT FITTINGS
	1) PHILLIPS 2) WIPRO 3) CROMPTON GREAVES 4) GE		1) PHILLIPS 2) WIPRO 3) CROMPTON GREAVES 4) GE 5) K-LITE
21.	CABLE GLANDS	22.	CABLE LUGS
	1) COMET 2) DOWELLS 3) BRACO 4) SIEMENS		1) DOWELLS 2) COMET
23.	CONNECTORS	24.	FLUROSCENT LAMPS
	1) ELMEX 2) CONNECT WELL 3) PHONEIX		1) PHILLIPS 2) OSRAM 3) CROMPTON GREAVES 4) BAJAJ 5) GEC
25.	COMPACT FLUROSCENT LAMPS	26.	MOTOR STARTERS
	1) PHILLIPS 2) OSRAM 3) HAVELLS 4) WIPRO		1) SIEMENS 2) L&T 3) CROMPTON GREAVES
27.	MONOBLOCK PUMPS	28.	LIGHTENING ARRESTORS
	1) KIRLOSKAR 2) CROMPTON GREAVES 3) CRI		1) PACTIL 2) HECO 3) ATLAS 4) G.K.ELECTRICALS
29.	TRANSFORMER UP TO 500 KVA	30.	TRANSFORMERS ABOVE 500 KVA
	1) PACTIL 2) EMCO 3) CROMPTON GREAVES 4) KIRLOSKAR 5) GEC 6) TESLA		1) KIRLOSKAR 2) GEC

SL. NO.	MAKES/AGENCIES/BRANDS	SL. NO.	MAKES/AGENCIES/BRANDS
31.	A.B. SWITCH & DO FUSE	32.	SELECTOR SWITCH
	1) PACTIL 2) JENCO 3) CROMPTON GREAVES 4) ATLAS		1) KAYCEE 2) SIEMENS 3) C&S
33.	INDICATING LAMPS	34.	CONTACTORS
	1) VAISHNO 2) ESSEN 3) PHILLIPS		1) SIEMENS 2) L&T 3) ABB 4) SCHNIDER ELECTRIC
35.	MEASURING INSTRUMENTS	36.	PF IMPROVEMENT CAPACITOR & APFC PANEL
	1) AMP 2) MECO 3) AE 4) ENERCON 5) PROK-DV's		1) EPCOS 2) NEPTUNE 3) L&T 4) CROMPTON GREAVES
37.	RELAY FOR AUTOMATIC PF IMPROVEMENT	38.	CURRENT TRANSFORMER
	1) EPCOS 2) CONZERVE 3) L&T		1) AE 2) RISHAB 3) KUPPA 4) L&T
39.	DATA CABLES & FACTORY MADE PATCH CORDS	40.	INFORMATION OUTLET/ RJ-45 CONECTORS/RJ-11 SOCKETS
	1) LEGRAND 2) D-LINK 3) FINOLEX 4) MOLEX 5) AMP		1) D-LINK 2) LEGRAND 3) MOLEX 4) SYSTEMAX 5) AMP
41.	TELEPHONE WIRES	42.	RG 6 CABLE FOR TV
	1) FINOLEX 2) DELTON 3) HAVELLS 4) RR KABLE		1) FINOLEX 2) DELTON 3) NATIONAL

SL. NO.	MAKES/AGENCIES/BRANDS	SL. NO.	MAKES/AGENCIES/BRANDS
43.	JACK PANEL	44.	RACK
	1) D-LINK 2) LEGRAND 3) MOLEX 4) SYSTEMAX 5) VALRACK 6) AMP		1) VALRACK 2) DIGITRON 3) HCL 4) A LINK
45.	FIRE ALARM PANEL	46.	SMOKE & HEAT DETECTORS
	1) HONEYWELL 2) CARMEL 3) ZICOM 4) NOTIFIER 5) MIRCOM/SECUTRON 6) MORLEY IAS		1) APPOLO 2) MORLEY IAS 3) EDWARD 4) SYSTEM SENSOR 5) HONEYWELL 6) MIRCOM/SECUTRON
47.	MANUAL CALL POINTS/ HOOTER/ INDICATOR		
	1) HONEYWELL 2) ZICOM 3) NOTIFIER 4) SIMPLEX 5) CARMEL 6) MIRCOM/ SECUTRON		

ADDITIONAL SPECIAL CONDITIONS :

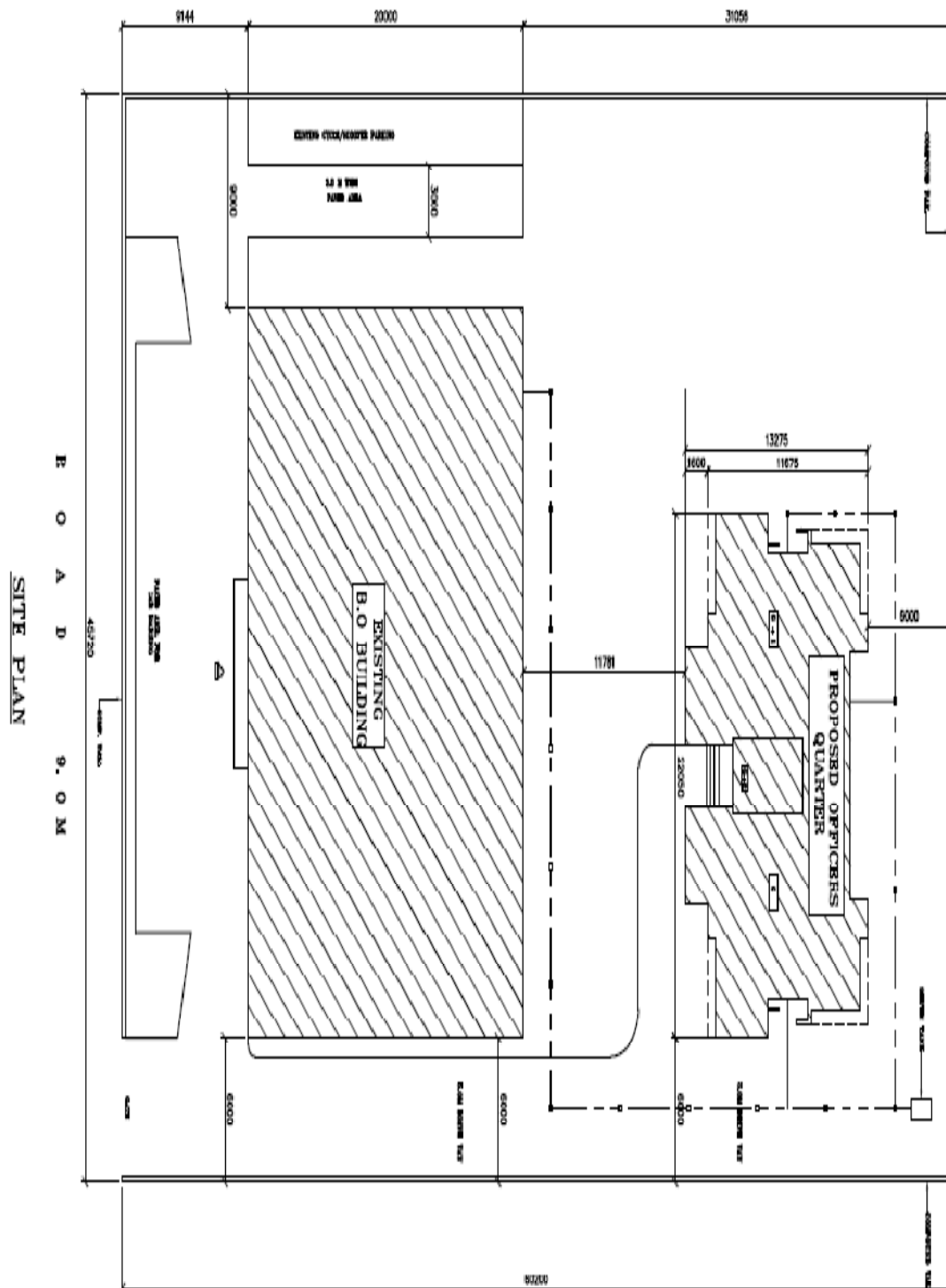
1. Life Insurance Corporation of India shall not be responsible for any act of nature or otherwise like Riots, Terrorist Activities, Curfew, Bunds by any Political Party or Activists, Stopping the work by any local or Government Authorities.
2. No Claim or Compensation on this account, from the Contractor, shall be entertained or paid. The rates quoted by the contractor shall include for all such similar activities. However, reasonable / justified Extension of Time shall be considered, as per contract conditions.
3. **Completion Certificate for the Building:** The contractor after completion of the work shall be responsible for obtaining the completion certificate from the appropriate authorities if required, and will make all necessary arrangements to procure the same. The contractor shall file applications and follow up with appropriate authorities and shall give all notices, required by the Acts, regulations or certificates and drawings as required and will make necessary arrangements to procure the completion certificate if required, without any extra charges. All incidental charges/ expenses associated with the above work shall be borne by the contractor. All inspection fees or submission fees paid by the contractor will be reimbursed by the owner against valid official receipts.
4. **Water and Sewerage Connection :** The contractor after completion of the work shall be responsible for obtaining the Water and Sewerage Connection from the appropriate authorities as required and will make all necessary arrangements to procure the same if the same is available there. The contractor shall file applications and follow up with appropriate authorities and shall give all notices, required by the Acts, regulations or certificates and drawings as required and will make necessary arrangements to obtain the Water and Sewerage connection if required, without any extra charges. All incidental charges/ expenses associated with the above work shall be borne by the contractor. All inspection fees or submission fees paid by the contractor will be reimbursed by the owner against valid official receipts.
5. The quoted rate should be inclusive of applying and liaison with Electricity Supply Authority for a domestic load of 5KW, single phase, 230 V for each flat.

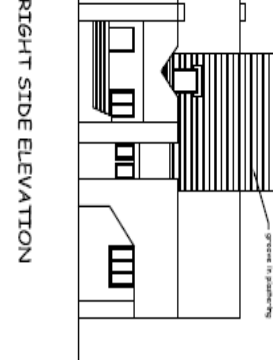
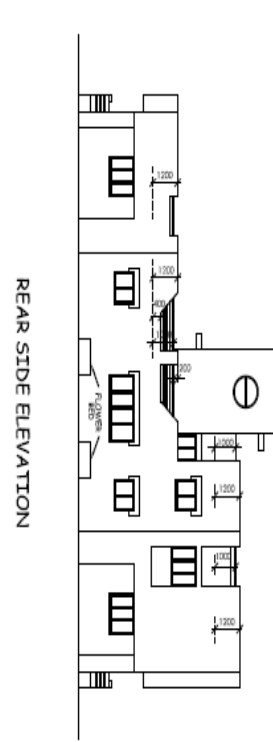
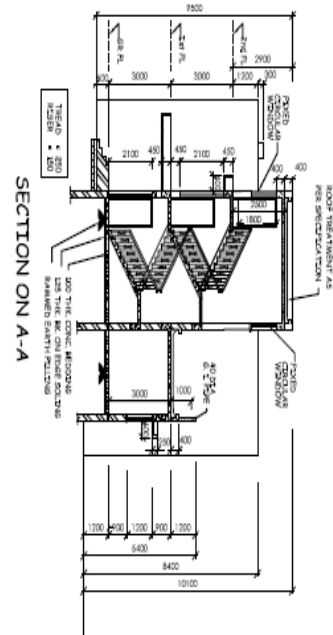
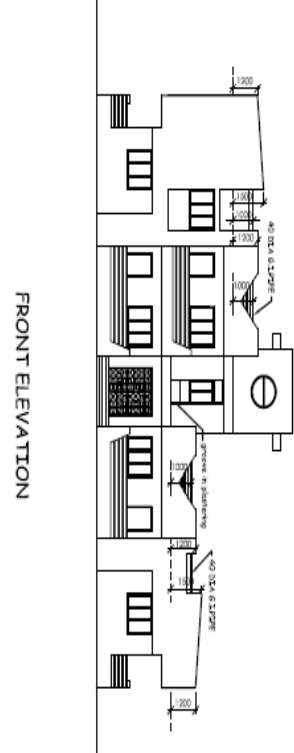
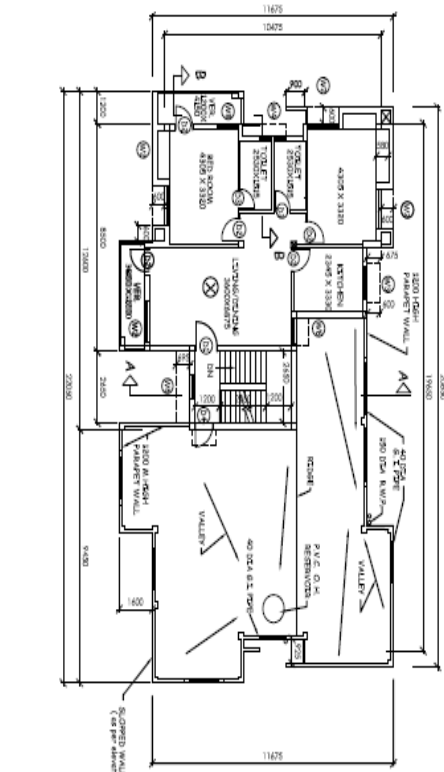
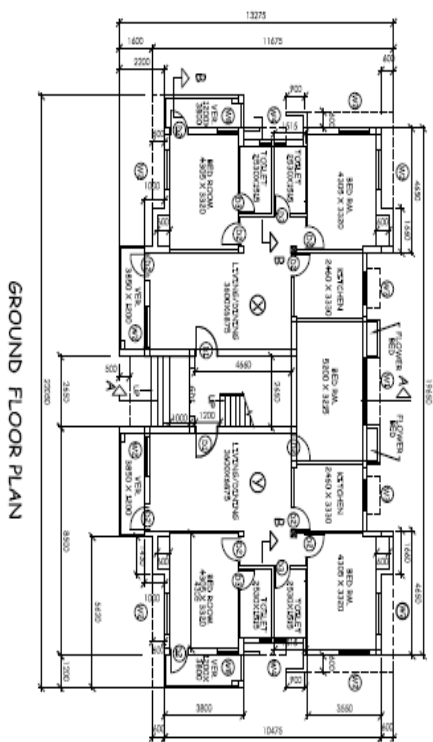
LIST OF DRAWINGS

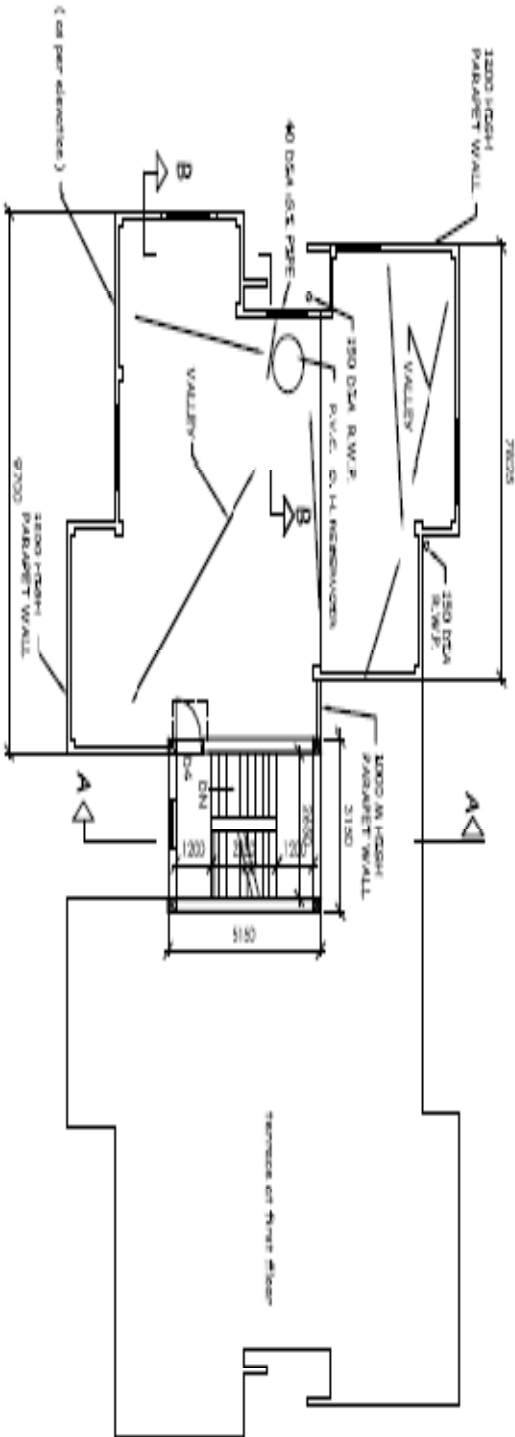
The following list of drawings is enclosed

ARCHITECTURAL DRAWINGS:-

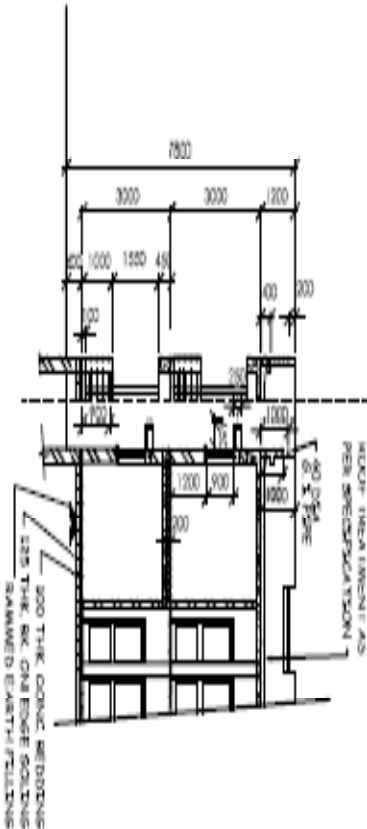
S. NO.	DESCRIPTION
1	SITE PLAN
2	GROUND FLOOR, FIRST FLOOR PLAN, FRONT RIGHT AND REAR SIDE ELEVATION,
3	TERRACE FLOOR PLAN, SECTION AT B-B
4	LEFT SIDE ELEVATION,



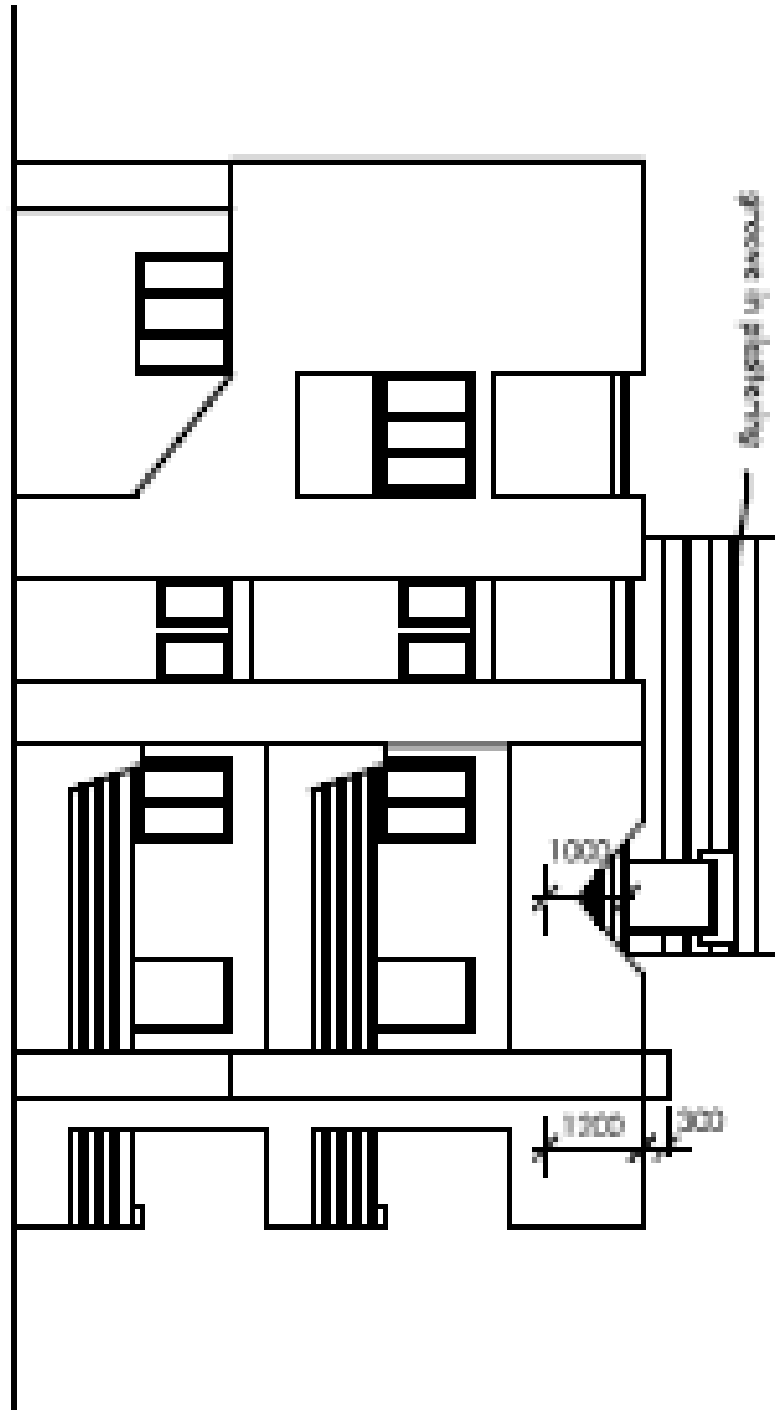




SECTION ON B-B



LEFT SIDE ELEVATION



LIFE INSURANCE CORPORATION OF INDIA

TRADE PREAMBLES TO SCHEDULE OF QUANTITIES

These Preambles will apply to respective trades of the Schedule.

1. EXCAVATION AND EARTH WORK

1. Contractor's rate shall cover for clearing the site of shrubs, brush wood, underground & small trees not exceeding 30 cm. in girth measured at 1 mtr. above ground so that laying out, collection of materials & excavation can commence without hindrance. The block levels shall be taken only after clearing site as above.
2. Measurement for payment excavation unless otherwise mentioned shall be as per drawing, dimensions of bed concrete. Any additional excavation needed for working space, form work, planking, strutting wherever required etc. shall not be measured separately & rates quoted shall include for the same.
3. Rates for excavation shall include shoring, timbering, strutting etc. for protection of excavated sides, bailing out surface water due to rains or sub soil water if encountered & dewatering by any pumps wherever required until all work below water level is finished to the satisfaction of the Dy. Chief Engineer or his representatives.
4. Black cotton soil shall not be used for refilling, around foundations & or filling under floors, soil used for filling shall be dry, free from roots & vegetable mould & shall be approved by Dy. Chief Engineer or his representatives.
5. Refer I.S. 1200 (Part-I), 1974 for classification of excavated material. Executive Director's (Bldgs.) interpretation regarding classification shall be final & binding on Contractor.
6. Excavated rock/boulders if any could be used for soling if approved by Dy. Chief Engineer or his representatives. Recovery at the rate of Rs. 500/- per Cu.mt. shall be made based on stack measurement after deducting 50% for voids.
7. Before starting excavation or filling work in site, the requisite block level of the entire plot shall be taken by the Contractor jointly along with LIC Engineers.
8. Filling in plinth with approved excavated soil &/ or soil brought from outside shall be measured net in position after consolidation. Before the item of filling, in with soil brought from outside is operate, the contractor shall take prior permission of the Dy. Chief Engineer or his representatives & also arrange to take measurements of filled in soil in plinth with excavated stuff from the site.
9. Contractor is requested to satisfy himself to the character of soil & excavation & collect his own information on all matters affects excavation.
10. The excess earth/dismantled debris/refuse shall be removed & transported at contractor's cost & disposed off as directed.
11. Recovery of old Reinforcement, Steel work in built up sections or in single section made of Tees, angles, Flats, Channels, Joists, etc. removed from old structure shall be @ Rs. 4000/MT & for the old full bricks @ Rs. 500 per 1000 bricks.

2. CONCRETE & FORM WORK

1. P.C.C. shall mean plain cement concrete.
R.C.C. shall mean Reinforced cement Concrete.
2. **CODE OF PRACTICE:** All workmanship, materials, tests & performance in connection with Reinforced Concrete shall be in conformity with IS. Code of Practice for Reinforced Concrete in Building IS : 456 - 1964 with amendments if any, unless otherwise specified, in this contract. Where otherwise specified, by provisions made in this contract shall hold good.
3. **CONTROLLED AND ORDINARY CONCRETE :** 'Controlled Concrete' & 'Ordinary Concrete' wherever so defined shall be as per definition in Cl. No. 5.3.1 of IS : 456 - 1964. All relevant specifications under 'Concrete' in these preambles & in General specifications shall be applicable to controlled concrete/ ordinary concrete or exposed concrete where so classified.
4. **VOLUME BATCHING :** The proportion of mixes is by volume. Cement shall not, however, be measured by volume but shall be measured by weight one bag of cement containing 50 kg. of cement shall be assumed to containing 35 litres (1.20 cft). When weigh batch mixing is used, prior approval of the Executive Director (Bldgs.) shall be obtained to co-relate volume mix to weigh mix.
5. **FORM WORK :** Form work or shuttering shall be water tight & of timber / steel / plywood.
6. **AGGREGATES :**
 - i) Machine crushed grade stone aggregate from approved source shall be used as coarse aggregate & shall conform to ISI standard. Aggregate shall be washed clean, if necessary. Unless otherwise mentioned, the maximum size of coarse aggregate shall be 20mm graded down. Where thickness of the concrete member is 75mm & below, the maximum size of coarse aggregate shall be so selected that it does not exceed the $\frac{1}{4}$ of the mini thickness of the size of the structural member & graded down. Rates quoted shall allow for these factors.
 - ii) Fine aggregate shall be graded coarse sand from approved source & conforming to I.S.I standards & shall be washed clean, if necessary.
7. **ALLOW IN RATES :**
 - a) Rates quoted for all concrete items shall include for centering, form work, if specified in the schedule of quantities, machine mixing, pouring, consolidation by mechanical vibrators, curing, stripping form work, hacking of concrete where they have to receive plaster (but the plaster on concrete etc. surface shall be measured & paid for separately under respective plaster items etc. comp. unless otherwise stated.
 - b) Rates for all concrete items shall include for :
 - i) Sinking of floors in toilets, kitchen, leaving or forming holes for taking out dowel bars for fan hooks, provision for fixing plumbing pipes & accessories & electrical conduits (if any) gaps, slopes etc. in shuttering as directed.
 - ii) Allowing work for other agencies being carried out by them like laying conduits, boxes, pipes, clamps etc. as directed before laying concrete.
 - iii) For forming chambers, bands, drip moulds in columns, beams, slabs, chajjas, sills, facias, openings etc. & wherever directed.

- c) In case of reinforced concrete work, the rate for concrete items shall allow for pouring concrete around reinforcement shall be measured & paid for separately unless otherwise stated in the item.
- d) Rates quoted for all concrete items, like beams, ribs, columns, slabs etc. shall include for structural members of any shape & sections like linear, circular, curved, of any other type as required &/or as per detailed final drawings for cantilever, including providing slopes to slabs, beams, chajjas, canopies etc. wherever required.
8. No concrete shall be poured unless & until all fittings & fixtures for electrical & otherwise, are inserted, laid & approved/passed by Engineer-in-Charge.
9. **SIZES OF RCC MEMBERS:** The sectional dimensions of PCC. & RCC members are subject to change & no extra claim from contractor will be entertained on account of such changes, sectional sizes mentioned are structural sizes, exclusive of finishes like plaster, unless otherwise stated in the item itself.
10. **JUNCTIONS OF COLUMNS, BEAMS ETC:** In case where at the junctions of columns, beams & slabs the composition of concrete mix of specified strength be different for columns, beams & slabs there in such cases only the richest concrete among these specified for any of these member shall be used at the time junctions & rates quoted for columns, beams & slabs or any member entering such junctions shall allow for the same. Also allow for spill over richer concrete in beams etc. to rational angle of repose of wet concrete required from practical considerations while concreting the junctions. No separate payment shall be made on this account.
11. Rates quoted for concrete include the forming & treatment of construction/expansion joints as shown on drawings or required at site, except for supply of copper & G.I. strip & which shall be paid for separately.
12. **WATERPROOFING COMPOUND:** Cement waterproofing compound wherever mentioned in the item shall be of any approved make & mixed by weight of cement as per the manufacturer's specifications & rates quoted shall include for the same.
13. **PRECAST CONCRETE:** Rates for Concrete items shall be inclusive of moulds, finished faces, hoisting to all heights & levels & setting in position including jointing in cement mortar 1:3 & cement grouting as per detailed drawings. Reinforcement shall be paid for under 'STEEL AND IRON WORK' section, unless otherwise specified.
14. Please note that unless otherwise mentioned in the items/ schedule of quantities, all concrete specified in this tender shall be ordinary grade concrete as per "TABLE II - CONCRETE MIX PROPORTIONS" Clause no. 2.4 under-sub-head "2" concrete & steel reinforcement of specifications for Civil Work.

3. BRICK WORK

1. Size of bricks shall be 23x11.5x7.5 cm nominal & shall be from appd. source. Bricks shall be well burnt first quality, having regular shape with sharp corners & edges & should stand all tests as required by ISI specifications. One brick wall shall be considered as 23cm. thick. Half brick wall shall be 11.5cm thick & brick on edge wall shall be 7.5 cm. thick.
2. Crushing strength of the bricks to be used in the work shall not be less than 75 Kg. per square cm. unless otherwise stated in item of the schedule of quantities.
3. The rates quoted shall include for all work like those in walls, jambs, pillars, mullions, steps, kerbs/threshold, corbels, pins & raking out joints, cutting, scaffolding & curing etc. & also for providing opening/niches in masonry for drainage/rain water poles etc.
4. The rate quoted shall also include for recesses, cutouts, etc. in brick work for electrical work & nitch for rain water pipe to be encased at a later stage in the brick work, all as shown on drawings & as directed on site.
5. Sand for masonry mortars shall be as per IS : 2116 - 1965 as applied to un-reinforced brick work.
6. For exposed brick work, selected & approved bricks shall be used having uniform colour, size & sharp corners & edges.

4. STEEL FABRICATION WORK

1. Rates quoted for reinforcement shall include for the cost steel, all fabrication including cutting of length as shown in the drawings, all labour in binding & cranking forming, hooked ends, storage, handling, hoisting etc. right up to placing of steel in position up to the final stage of work according to the drawings, providing necessary binding wire, temporary supporters & for rolling margin in calculated weight. All wastage shall be to the Contractor's account.
2. The rate quoted for reinforcement shall include for the cost of annealed steel binding wire of size not less than 0.90 mm & conforming to IS : 280 - 1962. The weight of the binding wire shall not be accounted for in the measurements. The rate shall also included for precast concrete cover blocks of specified sizes as directed.
3. The rate shall hold good for reinforcement in any structural member irrespective of its location & dimensions.
4. Reinforcement shall be placed as shown on the structural drawings & payment will be made on net measurement from drawings. Only such laps, dowels chairs & pins in reinforcement as approved by the Suptd. Engineer / Executive Engineer & shown on drawings shall be paid for. The Contractor shall allow in his rates for any wastage which will not be paid for. Rates shall allow for removal or rust by rubbing with wire brush as directed.
5. Welding or reinforcement bars will not be permitted unless specially authorized by the Executive Director (Bldgs.).

6. For steel or Tistrong – It shall be used as per recommendation of the manufacturers & rates shall allow for this.
7. Rate for M.S. railing, grills, rolling shutters, M.S. angles & tees in door frames, grills, door, ladder, run ladder, fan hooks, weld mesh grills etc. shall include for the following.
 - a) Fabrication, cutting & bending to required size, patterns & shape, drilling, punching, counter sinking, welding, filling etc. finishing, erecting, fixing in position.
 - b) Wherever the M.S. grills/railing/ rolling shutters M.S. weld mesh, grills are required to be fixed to stone/brick concrete jambs/floor, they shall be fixed by means of required number of M.S. lugs of 100 x 16 x 3mm &/or suitable size embedded/grouted in cement concrete block 1:2:4 &/or by means of suitable countersunk screws with rawl plugs.
 - c) Wherever the M.S. grills are required to be fixed to frames of steel windows & ventilators, they shall be fixed by welding.
 - d) Grill door shall be fixed by means of M.S. holdfast or required number, size & shape as approved, embedding/grouting the holdfast in 1:2:4 cement concrete block &/or rag bolts & nuts of approved size.
 - e) Both legs of both ends of M.S. ladders shall be fixed to concrete floors/slab by embedding/grouting in 1:2:4 cement concrete block base of required size.
 - f) M.S. rung - ladders shall be fixed in stone/brick/concrete work by embedding/grouting in 1:2:4 cement concrete.
 - g) In case of M.S. grills doors the Contractor shall provide & fix stone/brick concrete jambs to accommodate the sliding rod of alldrops.
 - h) Rate quoted for M.S. guard bars/M.S. grills to windows & ventilators/fanlights shall also include for making holes in frames of windows & ventilators/fan lights wherever required.
 - i) The fixing accessories like M.S. holdfast, lugs, screws, rawl plugs, concrete for embedding/grouting, bolts & nuts of any type GI pipe pieces & such other accessories for fixing. All these shall not be considered in the measurement of the weight/quality & shall not be paid separately.
 - j) Except for bar reinforcement, all exposed steel, cast iron, wrought iron & mild steel work, unless otherwise mentioned, shall be painted with three coats of synthetic enamel paint of first quality of approved brand, colour & shade, including & coat of primer as per specification of the approved manufacturer. Rates quoted shall include for the above although three coats of paint are specified. Contractor will have to do additional coats of paint if well finished surface is not obtained to the satisfaction of the Dy. Chief Engineer/Suptd. Engineer/Executive Engineer & there shall be no extra payment on account of this.
8. The rolling shutter shall be fixed over the opening by fixing the side-jamb guides against the walls (but not in between the jambs of the opening). For measurement of rolling shutter, the area of the actual opening covered shall only be considered.

9. **MEASUREMENT:** Weight of the steel reinforcement bars (Mild steel & high strength deformed bars) used in the construction shall be on the basis of the length incorporated in concrete & shall be computed in accordance with the table given below:-

diameter mm	weight per mtr. length (in Kg.)	diameter mm	weight per mtr. length (in kg.)
6	0.222	20	2.467
8	0.395	22	2.985
10	0.617	25	3.855
12	0.888	28	4.836
16	1.579	32	6.316

Note :

The weight per meter bars given in the table above are calculated on basis that steel weights 7.85 g. per cu.cm. In case of any error or omission in this table, the weight per meter length in kg. shall be computed on the basis of actual area & taking the density of steel as 7.85 gm per cu.cm.

5. **STEEL WINDOWS AND VENTILATORS & PRESSED STEEL FRAMES**

1. Specifications are applicable for the trades & as given elsewhere in the tender are applicable in except where otherwise mentioned in following paras or in the wording of items. The rates quoted shall cover for complying with the same.

2. i) Steel windows & ventilators shall be manufactured by any approved manufacturer as per list of approved makes/ brand.

Rates quoted for steel windows & ventilators shall include for cost of copper oxidized Mild Steel Hardware fittings & fixtures as shown on drawings. Rates quoted shall be for the make or group of makes as mentioned in respective items. Sections used shall be manufactured from approved good quality mild steel rolled sections conforming to IS : 7452 - 1974 & in accordance with IS : 1038 - 1975 (Revised).

ii) Sections for windows & ventilators shall be straightened on hydraulic stretching plant, cut to required lengths, & comers to be electrically flash butt welded, flushed to form one solid welded joint to conforming to requirements of welded joint under clause no. G.I. IS : 1038 - 1975 (revised). No other method of welding except electrical flash welding shall be permitted.

iii) Steel windows & ventilators shall be fixed to stone/brick work by means of standard M.S. lugs of size 100 x 16 x 32mm embedded in cement, & to concrete work by means of 125mm long counter sunk screws with rawl plugs. Rates quoted for windows & ventilators shall include for the same.

3. For glazing, approved aluminium beading shall be fixed by means of cadmium plated iron screws of adequate size & length. Approved quality special putty suitable for metal windows shall be used as per manufacturer's specifications. The hollow portion between the frames & the brick/ stone/ concrete surface & between the component part of the frame shall be filled up with mastic/cement & sand fillet as per manufacturer's recommendations or IS specifications.

4. Glass shall be as manufactured by any approved manufacturer as per list of approved makes/brand.
5. Each glass pane/louver shall be measured to the nearest 0.5 cm. both in width & height.
6. No import license shall be made available for obtaining any material available in India.
7.
 - a) Steel window/ventilators & doors shall not be manufactured till the manufacturer's shop drawings & samples have been approved by the Dy. Chief Engineer.
 - b) If particular section is not available, contractor should state what alternative section they shall use. The C.E. may ask for modifications/improvement in the shop drawings as required in keeping with good practice & I.S.S.
 - c) The Dy./ Chief Engineer's decision regarding shop drawings & different types of sections depending on the arrangement, area of the opening & height to be provided for windows/doors shall be final & binding on the contractor.

No extra payment shall be made to the contractor for providing all such section as directed. The rate for steel windows should provide for cadmium plated iron screws for fixing the beading.
8. Wherever M.S. grills are required to be fixed to frame of steel windows & ventilators, they shall be fixed by welding.
9. Rates of steel windows & ventilators shall include for M.S. weather bars of approved size & pattern to be provided the coupling members (wherever required) as per IS : 1038 - 1975 (revised) specifications.
10. Please note that all side hung shutters shall have projecting type hinges & all hinges shall be greased properly before fixing & projecting types hinges shall be protected with oil papers during construction.
11. The hardware, fittings & fixtures for the steel windows & ventilators shall be provided & fixed as per drawings & shall be in conformity with the stipulation in IS : 1038 - 1975 (Revised). Rates quoted shall include for the same.
12. Steel windows & ventilators shall be painted with 3 coats of synthetic enamel paint of first quality of approved brand, colour & shade including approved primer coat as per list of approved brand/makes. Although three coats of paint are specified, Contractor will have to do an additional coat of paint, if well finished surface is not obtained to the satisfaction of the Engineer in Charge & there shall be no extra payment on account of this.

5. SPECIFICATIONS FOR PRESSED STEEL DOOR/WINDOW FRAMES :

Material – Steel door frames shall be manufactured from commercial mild steel sheet of 1.25 or 1.6 mm thickness, conforming to IS : 4351 – 1976.

Steel door frames with or without fan light shall be made in the profiles described which may be manufactured to suit doors of either hand, opening inwards or outwards as directed by Project Engineer.

Construction – Each door frames shall consist of hinges jamb, lock jamb, head & if required, angle threshold. The whole shall be welded or rigidly fixed together by mechanical means. Where no angle threshold is required, temporary base tie shall be screwed to the feet of frames in order to forms rigid unit. Where so specified base ties shall be pressed mild steel 1.25mm thick adjustable to suit floor thickness of 35 or 40mm & removable, or alternatively, threshold of mild steel angle of section 5/25 mm, minimum shall be provided for external frames. **Fabrication** – Fixing lugs there shall be three adjustable lugs with split & tail to each jamb without fan light, & four for jamb with fan light. The head of the fixing lug shall be of one of the following lengths :-

- a) 95mm long for use with Profile A.
- b) 120mm long for use with Profile B.
- c) 160mm long for use with Profile C.
- d) or other approved size & profile as per requirement.

The head shall be made from flat steel strip 25mm wide & not less than 1.60mm thick.

The tail of the lugs shall be 200mm long & shall be made to steel strip not less than 40mm wide & not less than 3mm thick.

Hinges 100mm mild steel butt thickness shall be used. For frames for door shutters width less than 90cm, three hinges shall be welded to one jamb for single shutter. For frames for door shutters width more than 90 cm., four hinges shall be welded to one jamb for single shutter. Three hinges on each jamb of frames shall be welded for double shutters.

In all cases the hinges shall be fixed that the distance from inside of the head rebate to the top of the upper hinges & the bottom of the lower to floor is about 175mm. Hinges shall be made of steel 2.5mm thick with a zinc-coated removable pin of 6mm diameter. The space between the two leaves of the hinge when closed shall be 3mm & the leaf that is not welded to the frame shall have for counter sunk holes to take no.10 wood screws.

Mortar Guards – Mortar guards as instructed by Project Engineer shall be provided. These shall be welded to the frame at the head of the frame for double shutter doors to make provision for bolts.

Lock-Strike plate – There shall be an adjustable lock-strike plate of steel, complete with mortar guard, to make provision for locks or latches complying with the relevant Indian Standards. Lock-strike plates shall be of galvanized mild steel & fixed at 95 cm from the head of the frame.

Shock-Absorbers – For side hung door shutters there shall be less than three buffers of rubber suitable material inserted in the holes in the rebate & one shall be located on the centre line of the lock-strike plate & the other two at least 45cm above & below the center line of the lock-strike plate. For double shutter doors there shall be two buffers of rubber or similar suitable material inserted in holes in the rebate in the lock jamb only at the head & spaces 15cm. at either side of the centre line of the door.

Finish – The door frames shall be either hot-dip galvanized or painted or as specified. The surface shall be thoroughly cleaned, free of dust, mill-scale dirt, oil etc. Either by mechanical means, for example, sand or shot blasting or by chemical means such as pickling & then painted or galvanized as directed by Project Engineer. After pretreatment of the surface one coat, of steel primer (zinc chromate) & two coats of enamel paint as directed by Project Engineer shall be applied to the exposed surfaces.

Measurements – The length shall be measured in running meter correct to a cm. out to out of the frames.

Rate – The rate shall include the cost of labour & material involved in all the operation described above including one coat of approved steel primer (zinc chromate) & two coats of enamel paint etc. complete as directed.

6. WOOD WORK AND ALUMINIUM WORK

1. T.W. shall mean Indian Teak wood of well seasoned, good quality, uniform colour, reasonably straight, grains free from cracks & shakes, wood shall be generally free from sapwood but traces of sapwood may be permitted. Maximum moisture contents shall not exceed 10 percent with tolerance limit for average moisture content of all the samples in a given lot + 2 percent & moisture content of individual sample +3 percent of maximum permissible moisture content.
2. Generally wood shall be free from knots. However, wood with knots may be permitted provided individual hard & sound knot shall not be more than 40mm in dia. & aggregate area of all the knots shall not exceed one & a half percent of the area of the piece. Teak wood shall be got approved before incorporating in the work. Contractor should ensure that wood work does not warp or show other defects due to lack of proper seasoning.
3. Timber shall be wrought, framed & cut to shape as shown on drawings &/or as required.
4. **FLUSH DOOR SHUTTER** shall be of approved make as per list of approved makes/brand and shall be solid core block board commercial/Teak veneered/faced & provided with seasoned hardwood lipping which shall be included in rates quoted.

Plywood shall be of approved make as per list of approved makes/brand & shall be water proofing quality phenol bonded (shuttering type) unless otherwise specified.

5.
 - a) Practical Boards shall be of approved make as per list of approved makes/brand of water proof quality, Phenol bonded, 3 layer flat pressed of approved brand.
 - b) Medium Density Fibre Boards shall be of approved make as per list of approved makes/brand of water proof quality, Phenol bonded/Urea Formeldihyde as per item.

6. PERMISSIBLE TOLERANCES – (DOOR WINDOW FRAMES)

- a) Frames – A tolerance of $\pm 2/3$ mm shall be allowed in the finished cross sectional dimension of door, window & ventilators frames.
- b) Shutter for door, windows & ventilators – The finished work with a tolerance of $(\pm -) 3$ mm. tolerance on thickness shall be $(\pm -) .2$ mm, thickness of shutter shall be uniform through with a permissible variation not more than 0.8mm when measured at any two points.
7. Wherever painting is specified, wood work & joinery shall be painted with 3 coats of approved brand colour & shade, synthetic enamel paint of first quality, including approved primer as per list of approved makes/brand. Although 3 coats of paints are specified. Contractor will have to do an additional coat of paint, if well finished surface is not obtained to the satisfaction of the Engineer-In-Charge & there shall be not extra payment on account of this.
8. Wherever polishing is mentioned for wood work, it shall be wax/French polishing of approved finish as required. Where door, frames are fixed flush with plaster to walls, teak wood cover moulds/architrave shall be provided all round. T.W. cover mould shall be paid separately & shall be painted or polished as in doors/windows.
9. Unless otherwise specified rates quoted for shutters of doors/ windows/ fan light shall include for ordinary quality sheet glass plain or frosted, figured, wired glass or any other glass (as required) manufactured by m/s. Hindustan Pilkington or other equal & approved fixed with T.W. beading & approved putty.
10. Rates quoted for shutter of doors shall include for T.W. beading/T.W. planted beads for fixing panels of shutters of doors, wherever required to be provided. Rate also, shall include for painting/polishing of beading.
11. Rates quoted shall included for :-
Polishing all wood work with French or wax polish of approved quality and shade including the under surface as per the specifications to get a uniform finish or painting with two or more coats of first quality synthetic enamel paint of approved brand and shade over a coat of approved primer, including preparation of the under surface to get a uniform finish. Timbers faces coming in contact with masonry or concrete shall be painted with three coats of wood preservative and anti-insecticide paint before fixing in position. If proper evidence about seasoning and soundness of timber is provided the Engineer at site at his discretion may allow fabrication of sub frames and frames and paneled shutters.
12. Rates quoted for wood work & joinery shall include for rebates joints, chambers, mouldings, grooves, beads, laps, rounded angles, niches, nails, screws, pins etc.
13. Rates quoted for the item of the T.W. moulded hand rail (if required) for staircase/parapet wall (as the case may be) shall include the provision for special shape curve required the turning of the railing in conformity with the alignment of the railing. This shall be made out of one single piece of approved teakwood. No extra payment on this account shall be made to the Contractor.
14. Shutters of doors/ windows/ventilators/fan lights shall be measured net in a close position covering rebates of the frame. Overlap of two shutter shall not be measured.

15. For curved windows/ fan lights (if any) the area shall be measured from inside to inside of frame. Rate shall include for the T.W. beading required for fixing louvers as shown in the drawings (including painting/polishing to beading).
16. Rates quoted for doors windows/ fan lights shall include for :-
- Supplying & fixing M.S. holdfast of size 300 x 35 x 6mm as approved & shall be provided viz. 6 nos. fan light.
 - One end of holdfast to be fixed with posts of frames by 12 mm dia bolt & nuts welded to holdfast & other end to be fixed into jambs with 1:2:4 P.C.C. of dimensions as directed including making holes of required size in posts or frames, filling them with T.W. fillets properly etc. complete as per drawings no. CA/TD/055/00. No other method of fixing holdfast except that shown in this referred drawing shall be allowed to the contractor.
17. The contractor shall erect the frames & shutters etc. in proper alignment vertically & in workmanlike manner. The defects in this work if noticed/pointed out shall be rectified by the contractor at his cost. The contractor shall be responsible for protection of shutters & the frames fixed in masonry/concrete work during the progress of the work & till the buildings are handed over.
18. All wood work wrought & framed shall be measured net in cubic meters as fixed except in the following :-
The sectional area of mouldings, doors / windows / ventilators or fan light frames shall be taken as the area of the last square or rectangle from which the same will be cut.
Unless otherwise mentioned length of the door/ windows/ ventilators or fan light frames shall be measure out to out door i.e. the sight length of tenons shall be added. Vertical member of door frames shall be embedded in the buried length of frame will be added to sight length. Length shall be measure nearest to a centimeter. No horns shall be provided.
19. Hardware for doors, windows/ ventilators shall be of the approved brand as per list of approved brand/ makes.
20. All hardware shall be fixed with suitable screws to match the hardware & rates quoted shall include for fixing the hardware in position & cost of screws etc.

FLOORING & FINISHING

- Wherever specified terrazzo/marble mosaic tiles in flooring shall be of 250 x 250 x 20 mm of appd. colour & shade. Thickness of wearing layer of the tiles shall not be less than 6mm.
- Terrazzo/marble mosaic tiles of light shade shall be in white cement, medium shades shall be approximately 50% white & 50% ordinary cement & dark shades shall be in ordinary cement. The same shall apply in case of in situ terrazzo/marble mosaic, cement tiles & cement concrete floors if required to be finished in light, medium or dark shades. Rates quoted for light, medium/dark shades for tiles as well as for in situ terrazzo/mosaic & cement concrete finish shall include for necessary coloring pigment also.

3. Size of the marble chips for terrazzo/marble mosaic tiles shall be varying from the smallest upto 20mm size & shall be in required proportion & of approved colour & shade & rates quoted for terrazzo/marble/mosaic in situ mosaic finish shall include for the same.
- a) flooring & treads of steps/staircase shall be laid on a screed of lime mortar 1:3 (1 lime:3sand) or cement mortar 1:4 20mm thick average & floated in neat cement slurry.
 - b) Skirting, dado & risers of steps/staircase shall be fixed on backing of cement mortar 1:3, 12mm thick, with thick cement plaster.
 - c) Joints shall be finished neatly with white/coloured cement to match the colour of corresponding tiles/ stone.
 - d) Tiles/kota / shahbad/tendur stone slab in flooring shall be machine polished & tiles/shahbad stone in dado, skirting, treads & risers shall be hand polished.
5. Terrazzo/Marble mosaic/cement tiles shall be from any of the following manufacturers as per list of approved brand/makes.

6. MARBLE SLABS IN FLOORING AND LINING

GENERAL

Marble slabs shall be of the best Makrana Dongri Adanga marble or as specified in the item & from approved source. They shall be hard, dense, uniform & homogenous in textures. They shall have even crystalline grains & free from defects & cracks. The top surface shall be machine polished to an even & perfectly plane surface & edges machine cut due to square. The rear face shall be rough enough to provide a key for the mortar. Exposed edges of the treads/risers etc. of the entrance steps shall have machine polished edges. Marble slabs shall be of specified shape & size & shall be got approved from the Dy. Chief Engineer. No slab shall be thinner than the specified thickness at its thinnest part.

A. FLOORING :

Marble slabs in flooring shall be laid as follows & rates quoted shall include for the same.

- i) Marble slabs in flooring, treads of steps of staircase shall be laid on screed of lime mortar 1:3 (1 thoroughly slacked & only lime putty :3 sand) or cement mortar 1:4 20mm thick average & floated in neat cement slurry with necessary slope.
- ii) Joints shall be hair-fine width & in straight lines. They shall be grouted & finished neatly with white cement slurry of required consistency admixed with pigment to match the colour of the marble stone slab.
- iii) Flooring shall be given a coat or wax polish of approved make. Rate quoted shall include for the size of marble stone slabs as specified & for the pattern as shown on drawings.

B. MARBLE SLABS IN WALL LINING

Marble slab shall be of the best markrana Dongri Adenga marble from approved source. They shall be of selected quality, dense, uniform & homogenous in texture & free from cracks or other structural defects. Marble slabs shall be got approved from the Dy./ Chief Engineer before the incorporating the same in the work. The top surface shall be machine polished to an even & perfectly plane surface before they are fixed in position & shall have machine cut polished edges true to square. The dressed slabs shall be of the thickness as specified with a tolerance of $\pm 2\text{mm}$. the tolerance in wall lining when a straight edge of 4m. length is placed should not exceed more than 3mm. Marble slabs in wall lining shall be laid as under & rates quoted shall include for the same.

i) Cement mortar 1:3 pads of 12mm thick & of required width shall be struck on to the wall at close intervals & the marble slabs shall be pressed on to them firmly in pattern as shown on drawings. The remaining cavities if any, shall then be filled with thin grout of the cement mortar of the same proportion. The sound coming on gently tapping of the slab will indicate if there are hollows. When the hollows cannot be filled with grout & the finished slabs continue to give hollow sound tapping, the slab shall be removed & reset. The marble slabs shall be fixed to the wall by bronze cramps/holdfast 100 x 50 x 6mm size, 50mm long wide bronze angle 45 x 45, 1 1/2mm dia x 75mm long expansion bolts, brass wire hooks & bronze dowels pins 50mm x 6mm dia as shown on drawings. At horizontal joints of the slabs, adjacent slabs shall be held together by a bronze pin passing through a hole drilled in the slabs. In addition bronze cramps of above mentioned size shall be provided to anchor the slabs to the wall. The cramps/holdfast shall be counter sunk into the joints of slabs & it shall be located as shown on drawings. Minimum two such cramps shall be provided for each horizontal joint for each slab.

ii) The lining between marble slabs shall be hair fine & filled with white cement grout to match the marble.

iii) The lining shall be fixed true to plumb & in perfect line as shown on drawings. The surface shall be protected from sun & rain & cured for ten days & shall be finally hand polished before buffing with polishing felt pad & acid. The marble shall be finished with a coat of wax polish of an approved manufacturer.

Rates quoted shall include for the size of marble stone slabs as specified & for the pattern as shown on drawings. Granite stone/marble slab in wall lining shall have zero level edges & rate quoted shall include for the same.

7. In situ marble mosaic flooring, treads etc, shall be 40mm thick overall (under layer 30mm thick & top layer 10mm thick). In situ marble mosaic dado, skirting shall be 20mm thick overall (under layer 12mm thick & top layer 8mm thick). Under layer for flooring & treads shall be cement concrete 1:2 & for dados & skirtings, the mix for under layer shall be 1:3 cement mortar. The proportion of cement to marble chips of smallest to 20mm size in required proportion & in top layer shall be 1:2. Marble chips shall be of approved colour & shade. Flooring shall be machine polished whereas treads, skirting & dados shall be hand polished. Rates quoted shall incl. for all the above factors.

8. Cement concrete flooring when indicated to be coloured shall be rendered with 6mm thick cement plaster consisting of 1 part of ordinary cement to 3 parts of sand, coloured with addition of mineral pigment of Shalimar make or other equal & approved shade, thoroughly mixed cement when dry. The quantity of coloring pigment for coloured concrete flooring shall be such as to produce the required shade. This top layer of 6mm thick cement plaster mixed with coloring pigment shall be laid immediately after paying concrete for flooring.
9. Cement concrete flooring (Plain/coloured) laid in single layer shall be finished smooth & will have no trowel marks on the surface. If ordered, hand polishing with carborundum stones shall be included in the rates quoted.
10. Internal cement plaster to brick walls, columns, beams, lintels etc. shall be 12mm thick. R.C.C. slab soffits shall have cement plaster not less than 6mm thick. External cement plaster shall be 20mm thick in two coats (under coat 12mm thick & finishing coat 8mm thick) except for R.C.C. members not flush with brick work which shall be 12mm thick in two coats (under coat 8mm thick & finishing coat 4mm thick) such as R.C.C. facias, chajjas, canopies, drop walls, beams ribs, projected slabs etc.
11. Rates quoted for plastering & finishing items shall include for jambs, sills, drip mould, bands, forming grooves, chambers, curved angles, arises etc. & such other projections, which shall not be measured separately & paid for.
12. Rates quoted for painting & colour washing etc. shall include for providing shade of approved colour.
13. In case of painting, white washing & colour washing items, although number of coats are specified. Contractors will have to do additional coats if well finished surface is not obtained to the satisfaction of Executive Engineer & there shall be no extra payment on account of this.
14. Sand for mortar bedding for floors shall be from approved source & shall conform to IS : 2116 - 1965 as applicable to unreinforced masonry work.
15. Sand for plaster shall be from approved source & shall conform to IS : 1542 - 1960 as applicable internal wall & ceiling, plastering & external wall plastering.
16. Unless otherwise specified white glazed earware tiles shall be of 108 x 108mm size & minimum 5mm thick of first quality as per the list of approved makes/brands.
17. Acrylic plastic emulsion paint shall be of approved brand manufactured by any manufacturer as per the list of approved makes/brands.
18. Cement water proofing compound wherever mentioned shall be of approved brand manufactured by any manufacturer as per the list of approved makes/brands all as per manufacturer's specifications.
19. Flat oil paint for external or internal surfaces wherever specified shall be of approved brand manufactured by any manufacturer as per the list of approved makes/brands.
20. High class synthetic enamel paint (first quality) shall be of approved brand manufactured by any manufacturer as per the list of approved makes/brands.

21. Cement paint shall be cement water proofing decorative paint of approved brand manufactured by any manufacturer as per the list of approved makes/brands.

22. KOTA STONE:

Kota stone specified in the items shall be got approved from the CE. At its thinnest part no stone shall be thinner than the minimum thickness specified in the tender item. Kota stone used in the work shall be hard, sound, durable, resistant to wear. It shall be cut to shape & size as directed. Rough kota stone shall have plain surface.

For machine polished kota stone, the exposed surface of the stone slab shall be machine polished, having smooth even & true plane. The stone slabs shall be without any soft veins cracks or flaws & shall have uniform colour. Kota stone for floorings, skirting, tread 7 risers shall have even natural surface free from broken flakes on top & shall be machine cut, edges shall not be marred by careless dressing of slabs & patching up shall not be straight. Kota stone used in the work shall be brought from approved quarries.

23. TOLERANCE FOR TANDUR/SHAHABAD/KOTA FLOORING :

The thickness of the slab shall be as specified in the description of items. Tolerance shall be allowed for the thickness. In respect of length & breadth of slabs, a tolerance of 5mm shall be allowed.

24. CERAMIC TILES LINING :

FLOORING & DADO

Glazed / ceramic tiles shall be of approved brand manufactured by any manufacturer as per the list of approved makes/brands. The tiles shall be laid over the base coat of cement mortar 1:4, 20mm thick with a floating coat of thick cement slurry over it. Ceramic tiles shall then be set over the screed firmly to correct plumb line & levels. The joints shall be filled & finished neat with cement paste pigmented to the shade of the tiles. all as per detailed manufacturer's specifications. The tiles shall be cleaned with acid. Rates to include to the above besides scaffolding, curing etc. complete.

GRANITE WALL LINING/ VENEERED WORK

Dressing & rubbing

Every stone shall be mirror polished and cut to the required size and shape, dressed on all beds and joints so as to be free from waviness and to give truly vertical and horizontal joints as required, the back of stones shall be left rough cut, in order to ensure a good grip with the heating of backing. A sample of dressed stone shall be prepared as per required size and shape for approval and it shall be kept at site after being approved by Engineer-In-Charge. The dressed stone slabs shall be of the thickness as specified with a tolerance permissible as below :

SLABS :	a)	Length :	+2%
	b)	Width :	+2%
	c)	Thickness :	+3%

The tolerance in wall lining when straight edge of 3m length is placed should not be more than 2mm.

Mortar

The mortar used for fixing the stone shall be 1:3, (Cement : 3 coarse sand) and of the thickness specified.

LAYING

1. The stones shall be wetted before laying. They shall be fixed with mortar in position without the use of chips and underpinning of any sort. The care shall be taken to match the grains of veneer work as directed by the Engineer-In-Charge at site. Preferably the slabs shall be selected judiciously having uniform pattern of veins/streaks.

2. Where so desired, the adjoining stones shall be secured to each other by means of copper pins 75mm long and 5mm diameter or as specified.

3. Further the stones shall be secured to the backing by means of cramps. The material of the cramps shall have high resistance to corrosion under conditions of dampness and against chemical action of mortar or concrete in which cramps are usually embedded.

Cramps shall be of 25x6mm and 30cm long in case of backing of stone masonry walls and brick masonry walls thicker than 230mm. In case of backing with brick walls 230mm or less thick or RCC members cramps shall be of 25x6mm and length as per requirement made out of gun metal or any other metal as specified. Generally the outer length of cramp in half brick work backing shall be 115mm and in one brick wall backing it shall be 150mm. Typical details and shapes of cramps for such backing are as indicated in figure no. 2 for general guidelines. This can be modified as directed by Engineer-In-Charge if so, required at site. Cramps shall be spaced not more than 60cm apart horizontally.

Alternatively the stone may be secured to backing by means of stone dowels 10x5x2.5cm as per shape indicated in Figure 1.

3. The adjoining stones shall be secured to each other of gun metal cramps or copper pins of the specified size. The cramps may be attached to its sides (See fig. 3A,3B) or top and bottom (see fig. 3C,D,E,F) or sides top and bottom (see fig. 3G,3H). The general arrangements of cramps required for fixing facing unit to wall are illustrated in fig.3. The actual number of cramps and their sections, however, shall be as per requirements of design to carry the loads.

4. Where cramps are used to hold the unit in position only, the facings shall be provided with a continuous support on which the stone rests at the ground level and other storey levels, the support being in the form of projection from or recess into the concrete floor slab, or a beam between the columns or a metal angle attached to the floor slab or beams. These supports shall preferably be at vertical intervals not more than 3.5 m apart and also over the heads of all the openings. Such supports shall also be provided where there is transition from thin facings below to the thick facings above.

5. Alternatively the cramps may be used to hold the units in position and in addition to support the units thus transferring the weight of the units to the backing. Such cramps should be properly designed as per IS 4101 (Pt.I) – 1967.

6. The cramps may be of copper alloyed with zinc, tin, nickel, lead or stainless steel as specified.

7. The pins, cramps and dowels shall be laid in cement mortar 1:2 (1 cement : 2 fine sand) and their samples got approved by the Engineer-In-Charge and kept at site.

JOINTS

All joints shall be full of mortar, special care shall be taken to see that groundings for veneer work are full of mortar. If any hollow groundings are detected by tapping the face stones, these shall be taken out and relaid. The thickness of the face joints shall be uniform, straight and fine as possible, not more than 1.5mm and in the face joint, the top 6mm depth shall be filled with the mortar specified for the pointing.

Curing

The work shall be kept constantly moist on all faces for a period of at least seven days.

Protection

Green work shall be protected from rain by suitable covering. The work shall also be suitably protected from damage during construction.

Scaffolding

Double scaffolding having two sets of vertical supports shall be provided where necessary. The supports shall be sound and strong, tied together by horizontal pieces over which the scaffolding plank shall be fixed.

Measurement

The length and breadth shall be measured correct to a cm. In case of radially dressed or circular slabs in the work, the dimensions of the circumscribing rectangles of the dressed stone used in the work, shall be measured and paid for. The area shall be calculated in sqm nearest to two places of decimal.

STONE CLADDING WORK

Stone shall be of the type specified. It shall be hard, sound, durable and tough, free from cracks, decay and weathering and defects like cavities, cracks, flaws, sand holes, veins, patches of soft or loose materials etc.

Before starting the work, the contractor shall get the stones approved by Engineer-In-Charge.

The stone shall be cut into slabs of required thickness along the planes parallel to the natural bed of stone.

Dressing

Every stone shall be cut to the required size and shape, so as to be free from waviness and to give truly vertical and horizontal joints. They shall be hand or machine cut as per site requirement to the required thickness.

The dressing at the back shall not be done, so as to ensure better grip with the hearting or backing. The dressed slab shall be of the thickness as specified, with permissible tolerance of 2mm.

Mortar for fixing shall be as specified.

LAYING

The stone shall be wetted before laying. They shall be fixed with the mortar in position without the use of chips or underpinning of any sort.

Where so desired, the adjoining stones shall be secured to each other by means of copper pins 75mm long and 6mm dia. Or as specified.

Further stones shall be secured with the backing by means of cramps. The materials for the cramps shall be high resistant to corrosion under conditions of dampness and against the chemical action of mortar or concrete in which cramps are usually embedded. Cramps shall be of 25x6mm and 30cm long in case of backing of stone masonry walls and brick masonry walls thicker than 230mm. In case of backing with brick walls 230mm or less thick or RCC members cramps shall be of 25x6mm and length as per requirement made out of gun metal or any other metal as specified. Generally the outer length of cramp in half brick work backing shall be 115mm and in one brick wall backing it shall be 150mm. Typical details and shapes of cramps for such backing are as indicated in figure no.15 for general guidelines. This can be modified as directed by Engineer-in-Charge if so, required at site. Cramps shall be spaced not more than 60cm apart horizontally.

Alternatively the stone may be secured to the backing by means of stone dowels 10x5x2.5 cm as per shape in Figure 14 and the adjoining stones secured to each other by means of gun metal cramps or copper pins of the specified size. Minimum one cramp /stone dowel shall be used to secure one slab to backing.

Cramps may be attached to its sides (See fig. 16A, 16B) or top and bottom (see fig. 16C to F) or sides, top and bottom (see fig. 16G&H). the minimum number of cramps required for fixing facing unit to wall are illustrated in Fig. 16. The actual number of cramps and their sections, however, shall be as per requirements of design to carry loads.

Where cramps are used to hold the unit in position only, the facings shall be provided with a continuous support on which the stones rest at the ground level and other storey levels, the support being in the form of projection from or recess into the concrete floor slab, or a beam between the columns or metal angle attached to the floor slab or beams. These supports shall preferably be at vertical intervals not more than apart and also over the heads of all openings. Such supports shall also be provided where there is transition from thin facings below to thick facings below.

Alternatively the cramps may be used to hold the units in position and in addition to support the units thus transferring the weight of the units to the backing. Such cramps should be properly designed as per IS 4101 (Pt.I) – 1967.

The cramps may be of copper alloyed with zinc, tin, nickel, lead or stainless steel as specified.

The pins, cramps and dowels shall be laid in cement mortar 1:2 (Cement : 2 fine sand) and their samples got approved by the Engineer-in-Charge and kept at site.

The walls shall be carried up truly plum. All courses shall be laid truly horizontal and all vertical joints truly vertical. The stone shall break joints on the face for at least half the height of the course, unless otherwise shown in the drawings. The stone shall be laid in regular courses not less than 20cm height and all the stones shall be of the same height unless otherwise specified. No stone shall be less in length than one and half times its height unless otherwise specified.

As far as possible the backing shall be carried up simultaneously with the face work. In case of reinforced cement concrete backing, the lining shall be secured to the backing after it has set and got cured. The cramps shall be fixed in concrete at the required positions, while laying.

JOINTS

The joints shall be done with cement mortar 1:2 (1 cement : 2 fine sand). All joints shall be full of mortar. Special care shall be taken to see that the groundings for veneer work are full of mortar. If any hollow groundings are detected by tapping the face stones, these shall be taken out and re-laid. The thickness of joints shall be as small as possible, not exceeding 5mm. For a close butt jointed facing the thickness shall not exceed 1.5mm. The face joints shall be uniform throughout.

Where joint filler or compound is to be used the joints shall be raked out to a depth of at least 25mm after the mortar in the joints has set sufficiently and the filler or compound applied. The joints may be subsequently finished with a mortar suited to the appearance of the work. It is preferable to use joint sealing compounds where the facings are exposed to heavy rainfall and winds and their selections would depend upon local experience and availability of joint sealing compounds. In their absence only masonry mortars 1:2 (1 cement : 2 sand) which are proved to be successful from local exposure conditions shall be use.

MEASUREMENTS

The length and breadth of the finished work shall be measured metre correct to cm. The area should be calculated in Sq.mt. correct to two places of decimal.

RATE

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

8. WATERPROOFING & ROOFING

a) Water proofing to sunken portion of floor slabs in W.C. bath etc. The treatment shall consist of following operations:

i) 20mm thick plaster with cement mortar 1:4 mixed with any approved waterproofing compound as per manufacturer's specifications over the slab & sides upto the top of sunken portion.

ii) Filling the sunken portion with well burnt bricks in required number of layers set in cement mortar 1:4 mixed with approved water-proofing compound as per the top surface as per required gradient to receive the floor finish.

iii) The treatment shall be guaranteed as detailed under b(ii) below.

b) TREATMENTS OVER ROOFS :

i) The waterproofing shall be got done from anyone of following proprietary specialist firms & under their direct supervision & strictly in accordance with their specifications.

ii) the treatment shall be guaranteed against any seepage/leakage/ dampness etc. for a period of ten years from the handing over of the building to L.I.C. The guarantee shall have to be given by the proprietary specialist firm directly to the L.I.C. of India. on judicial stamp paper in approved proforma of the L.I.C.

The amount @ 10% shall be deducted from R.A. Bill/Final bill from the items of water proofing trade having 10 years guarantee. (i.e. terrace water proofing treatment, khurras, addl. Thickness, plastering and brick bat filling in sunken portions).

The 50% of retention money for this trade will be refunded after expiry of the two successful monsoons balance 50% will be refunded expiry of guarantee period of 10 years provided that there is no leakage, dampness etc.

iii) The rates shall include testing of the treated areas by ponding with water, the water shall be made to stand for 120 hours in 150mm ht. average the period of testing. In case of leakage/dampness the same shall be rectified completely & testing shall be redone until all treated surfaces are found to be free from any leakage/dampness/seepage.

iv) Min. thickness of treatment shall be 75mm. The slope of the finished treatment shall not be flatter than 1 in 120.

v) For the purpose of payment exposed area (in plan) of the RCC slab treated shall be measured (i.e. area before treatment / plaster between parapet/wall etc. & vertical surfaces shall not be measured. In case of sloping roof slab exposed area of the inclined portion shall be measured. Rounding of junctions at terrace will not be measured or paid for separately.

vi) The quoted rates shall be valid at all hts. & all floors.

1. CRAZY MARBLE MOSAIC FLOORING/TOPPING ON TERRACE.

Work of crazy marble mosaic tile topping on terraces are given in the specifications for civil work :

Rates quoted shall include for the following factors :

i) Tile piece shall be laid on screed on lime mortar 1:1:1 (1 cement: 1 surkhi: 1 sand) 20mm thick (average) & floated on neat cement slurry in required levels & slopes in crazy fashion.

ii) The joints between the pieces shall not exceed 3mm in width & shall be slidly filled with cement mortar 1:3 mixed with waterproofing compound & finally flush pointed on top with neat cement mixed with water proofing compound.

iii) Cement waterproofing compound of approved brand manufactured by any manufacturer as per the list of approved makes/brands all as per manufacturers specifications shall be added to components of the above mentioned screed float of mortar bedding & cement floating coat.

iv) The junction of the topping/paving & the parapet wall shall be rounded/covered to about 75mm radius & the topping/paving shall be extended up to the parapet wall for 15cm. The top edge shall be finished in a neat horizontal line & tucked in groove in the wall. Bel mouths around rain water pipe inlets etc. wherever required for affecting drainage, shall be formed in crazy marble mosaic tile piece finish. Necessary channels/dishing as required shall be also formed.

v) After the topping/paving has been laid as required or the day's fixing work is completed the surplus cement grout that may have come out of the joints on compacting shall be cleaned off.

- vi) Proper slopes shall be imparted to the finished surface to drain off the rain water easily without any stagnation & where on the finished surface.
- vii) Bitumen painting of slaw small extend up the parapet/kerb/upstand for 150mm.
- viii) Necessary roundings/covers near parapet/kerb/upstand shall be done & junction made leak-proof.
- ix) Dishing near rain water outlets.
- x) Preparation of channels as required.

2. MEASUREMENTS

- i) Measurements for lime concrete as well as for crazy marble mosaic flooring/copping on terrace shall be only the respective flat area in plan of the terrace between the exposed internal faces of parapet walls/curbs/up stands portions, coving rounding etc. shall not be measure.
- ii) While measuring the average thickness mentioned in the item, thickness of roundings/coves near the parapet walls/curb and the portion carried over in the parapet walls shall not be considered.
- iii) Wherever the R.C.C/Brick/Stone/Corbelling courses are required to be provided on the same terrace floor, they shall be in line & level with each other.
- iv) The contractors shall ensure water tight/leak proof construction. The contractor, if they so desire may carry out any further treatment (in addition to the water proofing treatment specified above) for water proofing of surface as considered necessary by them, however, the rates quoted by them for the items shall be deemed to allow for such additional treatment & no extra amount shall be paid for the same.

9. MISCELLANEOUS WORK & ALUMINIUM WORK

- I. All aluminium work shall be free from defects impairing strength, appearance & shall be of the best available quality for the purpose specified. The aluminium alloy used in the manufacturer of the extruded doors/ windows/ ventilators/ partitions sections shall correspond to IS designations HE 9-WP of IS : 733 – 1956. "Specifications for wrought aluminium & aluminium alloy bars, rods & sections (for general Engineering purposes)". Hollow aluminium sections & coupling sections used shall conform to IS designation HV 9-WP & Aluminium alloys extruded round tube & hollow sections (for general Engineering purpose only. Contractors shall commence manufacturing of doors, windows, & ventilators only after the shop drawings showing full size, sections, thickness of metal, details of construction, hardware etc. submitted by them are approved by the Employer.

Where aluminium comes in contact with concrete, brickwork, plaster or any other dissimilar metals, it shall be coated with & coat of zinc chromate conforming to IS : 104 – 1950. Contractor shall cover all the anodized finish work with a thick layer of clear transparent lacquer base on methacrylates or cellulose butyrate to protect the surface from wet cement during installations. This lacquer coating shall be removed after the completion.

All the manufactured doors, windows, ventilators & partitions shall be stacked on site under cover. Damaged surfaces with defects like scratches etc., on finished work shall not be accepted. Fabricated materials shall be created in an approved manner to protect the material against any damage during transportation. Loading & unloading shall be carried out with utmost care. The doors, windows & ventilators on arrival at site shall be carefully examined to detect any damaged pieces. Arrangements shall be made for expeditious replacement of damaged pieces/parts. Materials found to be acceptable on inspection only shall be used.

All exposed surfaces of sections for aluminium doors/windows/ventilators/partitions incl. beadings & other accessories shall be anodized/powder coated after fabrication, in a manner conforming to IS : 1868 - 1968 & to approved finish. Anodizing/powder coating shall be in matt finish natural colour & anodic coating shall be of a minimum thickness of 15 microns. Powder coating shall be of minimum thickness of 60 microns with approved Epoxy/ pure polyester paint powder all as per the specifications of specialized agencies.

2.

ALUMINIUM DOORS, WINDOWS, VENTILATORS & PARTITIONS.

Aluminium doors, windows & ventilators shall be manufactured from sturdy extruded sections of approved manufacture & shall be aluminium alloy from one of the manufacturer/s as given in the attached list of approved makes.

Contractor shall design & provide sturdy sections/members of doors, windows, ventilators & partitions including combination of joints so as to withstand wind load of high intensity.

The frame shall be square & flat & corners of the frames being fabricated to true right angles. Both the fixed & opening frame shall be of sections which have been cut to length, metered & mechanically joined &/or electrically welded at corners as required for satisfactory performance. Sub-dividing bars shall be accurately machine milled & fitted to form harline joints. The jointing accessories such as cleats, brackets etc. shall be of such material as not to cause any bi-metallic action.

Dimensions shown in the drawings are overall height & width to the outside of the frames of aluminium doors, windows & ventilators. These dimensions are derived after allowing 12.5mm clearance on all four sides for the purpose of fittings windows, doors & ventilators into the openings. Contractors are advised to verify the dimensions before fabricating & fixing the doors, windows & ventilators in position.

3.

METHOD OF FIXING

a) Aluminium doors, windows, ventilators & partitions in brick work & concrete work :-

Aluminium doors, windows, ventilators & partitions shall be fixed to brick work by means of slotted steel adjustable lugs (natural finish), not less than 100mm x 16mm x 3mm with counter sunk galvanized machine screws & nuts 19x6mm & to concrete work by means of 45mm x No 10 galvanized wood screws & dash fasteners of suitable size & make.

b) **FIXING SCREWS AND LUGS.**

Outer frame shall be provided with fixing holes centrally in the web of the section at appd. intervals. Any steel lug coming in contact with aluminium should either be galvanized or given a coat of bituminous paint. The members should be designed not only for its strength, stability, stiffness, against all odds, but also for easy operations, water tightness, easy replacement of glass & cleaning from inside. All screws used shall be of adequate size & shall be of cadmium plated brass.

4. **GLASS AND GLAZING**

Glass shall be of type & quality specified in the schedule of quantities & manufactured by one of the manufacturer as per the list of approved makes. Before installation of the glass the contractor shall ensure the following :-

- a) All glazing rebates shall be square, plumb true in plane, clear, dry & free from dust.
- b) The glass edges shall be clear & cut to exact size, glass with chipped or damaged edges shall be rejected.
- c) The glass shall be set in glazing clips & be installed to achieve proper water tightness.
- d) Suitable PVC or Neoprene gaskets shall be used for fixing glass so as to prevent rattling.
- e) Beading shall be of anodized aluminium section and shall be snap-on type having mitred either triangular or rectangular as per contractor's design & shall not be less than 0.13 kg. per RM.
- f) Any hollow portion between the frame & the brick / concrete surfaces & the component parts of the frame shall be filled up with suitable mastic/cement & sand filled as per IS specifications & rates quoted shall include for the same.
- g) If required by the Dy. Chief Engineer putty shall be applied to the face of the bead which is in contact with glass. Putty would also be filled, if necessary at the back. Putty used for glazing shall conform to I.S. 420 - 1953. On completion of the job, all glass shall be thoroughly cleaned & free from dirt, putty or other adhering material.

Wastage of cutting of glass shall be to contractor's account. Frosted/ground/pin headed glass shall be set with smooth surface outside.

The members proposed to be provided by the contractors for aluminium doors, windows, ventilators & partitions shall be of approved quality & sturdy to withstand the wind pressure of high intensity & day to day handling & shall be free from rattling, leakage etc. if required, contractor shall furnish the detailed design calculation to substantiate the sturdiness of each door, window, ventilator & partitions, the same shall be carried out by the contractor & suitable adjustment shall be made on basis of relevant tender items.

5. Aluminium doors, windows, ventilators & partitions shall be locally manufactured as per the design & drawing (which shall be approved by the Employer), from the extruded sections of one of the manufacturer/s as given in the attached list, including fittings & fixtures as shown on drawings.

6. The Dy. Chief Engineer reserves the right to delete any or all items of this trade & allot the work under this head to any specialized agency/agencies. No claim what ever shall be entertained on this account.

7.

MODE OF MEASUREMENT.

Aluminium doors, window, ventilators & partitions shall be measured by weight only. The weight shall be calculated as per theoretical weight/ actual weight whichever is less. Any wastage of aluminium sections shall be on contractor's account. The weight of screws, lugs, nuts & bolts, butt hinges, hollow hinges, neoprene gaskets, hardware fittings & fixtures shall not be considered for payment. The rate shall include for fixing of fittings & fixtures shown on shop drawings approved by Engineer-in-Charge.

9.

RATE TO INCLUDE:

Apart from other factors mentioned elsewhere in this tender document, rate for the items of supplying & fixing aluminium doors, windows, ventilators & partitions shall also include for the following, unless otherwise specified :-

- a. All materials & labour required for supplying & fixing in position approved anodized/powder coated aluminium doors, windows, ventilators & partitions & described in the trade at site of work.
- b. After the shop drawings are approved, the contractor shall supply one sample each of window & ventilator with hardware etc. for approval as directed.
- c. Supplying & fixing in position glass of specified thickness, type & quality along with putty, glazing clips & anodized/powder coated aluminium beading of required section.
- d. Supplying & fixing all accessories such as hinges, cleats, beading, screws, nuts, bolts, lacquer, gasket, putty for fabrication & fixing doors, windows, ventilators & partitions to concrete/ masonry surface as described in the trade.
- e. Filling sealants as per details to ensure water tightness. All the sealants must be permanently resilient & non bleeding nature.
- f. Protecting the surfaces & edges around doors, windows, ventilators & partitions from any damage while fixing the same.
- g. Removing all protective coverings & cleaning the door, window, ventilator & partition frames.
- h. Neoprene / PVC weathering strips as required.
- i. Drip strip to drain out water falling on the members of the frame.
- j. Filling in cement mortar 1:4, the space between the concrete surface & the frame windows & ventilators.
- k. PVC or rubber gasket for fixing glass.
- l. Cadmium plated brass screws wherever required.
- m. Galvanized/ aluminium channels pieces, coach screws, rawl plug etc. of required size & number for fixing door, windows, ventilators & partitions frames in position.
- n. Necessary scaffolding/cradle for erection of aluminium doors, window, ventilators & partitions in position.

- o. Rates for sliding windows & ventilators to include for adequate arrangements for draining out water collected in the channel of the outer frame.
- p. All rates quoted in the trade shall include for supplying & fixing.
- q. Swing door shutters shall include for double action oil check floor springs of "Everite" or "Hardwyn" other equal & approved make & size including embedding the floor springs in the flooring & making good the same.
- r. For all window & ventilator openings, contractor shall prepare M.S. retrievable plate frames with necessary tolerance for obtaining the correct dimensions of opening in concrete/brick masonry works.

10. & 11. SANITARY, WATER SUPPLY, PLUMBING & DRAINAGE WORK

1. GENERAL

These preambles apply to all the sections of the "Schedule of Quantities" although they may not be repeated later.

- 2. In case any variation or discrepancy is found between the description in the schedule of quantities will take precedence over the specifications for Sanitary work.

3. RATES TO COVER:

a) - Whether specifically mentioned or not, the contractor should cover in the rates quoted by him in the Schedule of quantities, for all the conditions, materials & labour (up to incorporation, in acceptable work) covered in the preambles. The contractor should also cover in his rates for the method of work, cost of materials, labour etc. to comply with the "General Specifications", "Special conditions" (if any) & all documents of this contract.

b) The contractor's rates shall cover for all materials, tools & plants, scaffolding & everything necessary, for the proper execution of the work to the satisfaction of the C.E. All materials & workmanship used in the execution of the work shall be the best or first quality & description, unless otherwise stated. All materials or procedure or specifications for work, unless otherwise stated, shall conform to the current Indian Standard whether or not specific mention made thereof. The contractor shall be responsible for, & shall replace or make good at his own expense, any materials lost or damaged, or of quality not approved.

- 4. SUPPLY & FIX - All rates quoted shall include for "Supplying & fixing" although the same may not have been mentioned in the item of the schedule of quantities. Words "Providing & fixing" where used shall have same meaning as "Supplying & Fixing".

- 5. DESCRIPTION OF ITEMS CLARIFICATION - Description of item shall mean its description in all relevant parts of the tender including that described in these preambles. General specifications, General instructions etc. Every care is taken to describe an item as clearly as possible if meaning or any of the items is not clear, the contractor is advised to have the clarification in writing from the office of the Dy. Chief Engineer.

- 6. PRICE FLUCTUATION - Rates quoted by the contractor shall be firm throughout the currency of the contract (including extensions of item, if any, granted & will not be subject to any fluctuation due to variation in cost of materials/labour).

7. The C.E. reserves the right to increase or decrease &/or revise the scopes of contract if required at his own discretion & the decision of the Dy. Chief Engineer in this respect shall be final & binding to the contractor. No claim what so ever from contractor on this account will be entertained.
8. **WORK TO BE COMPLETED WITH CIVIL WORK** – The work involved in this contract shall be completed along with civil work. If any extensions to the civil work is granted or if civil work gets extended beyond its expected date of completion for any reason what so ever & for any period of time a corresponding extensions of time will be granted to the Sanitary contractor for completion of his work. No claims whatsoever by the sanitary contractor on account of any delays in the completion of the civil work will be entertained by the C.E.
9. Contractor shall be required to extend the maximum co-operation to the other contractors like those involved in of civil work, electrical work, road work etc.
10. The work involved calls for a high standard of workmanship combined with speed.
11. The contractor shall have to carry out all ancillary & connected works within the boundary of the plot of the proposed work & inside the building if ordered to do so by the Dy. Chief Engineer at the rates quoted in the schedule of quantities, at any time during the currency of this contract including extension of times, if any granted.
12. **SAMPLES** – The contractor shall at his own cost, furnish at the earliest possible opportunity before work commence any samples of materials or workmanship that may be called for by the Executive Engineer for his approval & any further samples in case of rejection until such samples are approved. Such samples when approved shall be the minimum standard for the work to which they apply. Rates quoted shall cover for such preliminary work, which shall not be paid for separately.
13. The executive Engineer reserves the right to fix the order in which the various items of work involved in this contract are to be executed & contract shall comply with the same. There shall be no extra claims on account of this.
14. Contractor should ensure that each & every quoted rate is workable & self supporting. If called upon by the Dy. Chief Engineer detailed analysis of any or of all rates shall be submitted. The Dy. Chief Engineer not bound to recognize contractor's analysis & reserves the right to reject abnormal rates quoted by the contractor. In case there are inconsistencies in the rates for items of same schedule of quantities the lowest of such rates will be considered as the rate for all such items, unless Dy. Chief Engineer finds that there justifications for such inconsistent rates.
15. All work shall conform to the description given for each of the items, in addition to the bye-laws of the Municipality/ Public Health Authority within whose jurisdiction the items are to be executed. Contractor shall obtain approval to drainage & water supply work & work shall be considered as complete only when the contractor produces "No objection & completion Certificate" from the Municipal/ Public health Authorities. Rates quoted shall include for the same.
16. All sanitary & plumbing work shall be carried out through licensed plumbers, as per the bye-laws & regulations of the concerned Municipal Authorities.

The contractor shall complete all the formalities of local/Municipal Authorities in respect of the work covered under this tender including getting the water supply & drainage plans approved. After completion of work the contractor shall obtain the drainage & water supply completion certificate including water sufficiency certificates from the Municipal Authorities. No charges whatsoever, either professional of Municipal including any deposit of any other charges required to be paid for getting the materials tested & approved from the Municipal Authorities etc. obtaining permission, certificates etc. will be paid to the contractor & the rates should be based accordingly.

17. All joints in piping shall be made properly so as to be mechanically sound & leak proof & shall satisfy water & smoke test. Leaking or sweating joints shall be remade to Executive Engineer's satisfaction at contractor's expense.
18. Rates quoted shall allow for the following :-
 - a) Excavation in all types of soils except in hard rock, refilling & carting away surplus materials to contractor's own dump or as directed, for manholes inspection chambers, gully traps water supply & drainage lines & appurtenances.
 - b) All subsidiary fastenings, fittings & fixtures required even though they may not have been specifically described under particular items.
 - c) All fittings fixed to walls will have approved clamps fixed to wooden plugs.
 - d) Two coats of approved ready mixed paint over red oxide primer to all exposed iron or wood work including C.I. brackets, G.I. pipes & C.I. pipes. All G.I. pipes whether laid in ground or concealed in walls or floors shall be coated with bitumen, wrapped with Hessian & again coated with bitumen. All C.I. pipes fixed in chases or concealed in floors shall be given three coats of white zinc or any other colour over a red oxide primer. Lead pipes shall be painted in similar manner as C.I. or G.I. pipes. A.C. pipes shall be painted to match the surrounding finish.
 - e) Making holes through concrete/masonry, making good the work & re-doing & plastering the same to match the surroundings.
 - f) For all pipes, rates shall be inclusive of all fittings & specials such as couplings, bends, unions, sockets, shoes, cleaning eyes, tees, plugs, reducers, offsets etc. & making joints & connections to valves, tanks pumps & existing pipe lines etc. as required.
 - g) Cutting chases for concealing pipes in wall & floors & making good with cement plaster.
 - h) Fixing of drainage pipes & rain water pipes 5cm away from the wall by means of holder bats fixed to wooden plugs.
 - i) Rates quoted shall include for hoisting to & work at all levels & lift of materials shall not form any criterion for any extra claims.
 - j) Cutting into existing manholes/chamber above the invert level of the existing drain but without drop arrangements & not disturbing existing benching of manhole/chamber including making good the same.
 - k) Disinfection & flushing of water supply mains as directed.

D) Testing the installations by smoke & water test.

19. The contractor shall be responsible for the adequacy & efficiency of the entire plumbing system & if in his opinion he finds any serious objections to the system shown on the drawings he shall get forth his objection of his suggestion to ensure adequacy & efficiency of the said system & notify the Dy. Chief Engineer before proceeding with the works.
20. The work should be executed simultaneously with completion of the General Building work & the contractor shall take care to see that no damage or breakage is done to work once it is constructed & finished. The sanitary work should be so adjusted that it does not hold up the general construction or other contractor's works.
21. All the sanitary ware & fittings shall be white glazed vitreous china of approved make.
22. Unless otherwise specified pipes for water supply shall be "Medium" quality galvanized steel tubing (b class) of approved make, welded & seamless & socketed.
23. All C.I. pipes & fittings shall be of heavy quality & approved make.
24. Plumbers brass work or gunmetal valves & fittings shall be of heavy quality & of approved make with tested ISI mark. All sanitary appliances, pipes, & fittings shall be of approved make & brand as per list of approved makes brand of materials mentioned elsewhere in the tender.
25. Rates for items with excavation shall include for shoring, timbering, strutting etc. for protection of excavated sides, bailing, out water due to rains of subsoil water of encountered & dewatering by pump wherever required until all work below water level is finished to the satisfaction of the E.E.
26. The proportion of mixes for concrete work is by volume, cement shall not however be measured by volume, but shall be measured by weight. One bag of cement containing 50kg. of cement shall be assumed to contain 35 lit. (1.20 Cft.) Unless otherwise specified, ordinary Portland cement shall be used complying with the requirement of latest specifications.
27. Bricks used for construction of manholes, gully trap chambers etc. shall be table moulded & from approved source. Bricks shall be well burnt, first quality, having regular shape with sharp corners & edges. It shall not absorb water more than 20% of the its own weight when dry.
28. The thickness of plaster where specified is the minimum thickness required over the proudest part of the wall & all dubbing out shall be included in the rates quoted. Sand for mortar & plaster shall be clean, free from salt, loam, clay, shells, vegetable matter & fit for use in the opinion of the E.E.
29. Cement waterproofing compound wherever mentioned shall be of approved make & used as per manufacturer's specifications, the rates quoted for items where water proofing compound is specified shall include for the same.
30. The contractor shall obtain all necessary permission, fill up all the requisitions, test reports etc. He shall include all such costs incidental to the work. The contractor shall obtain drainage completion certificate & water sufficiency certificate from the authorities without any obligation.

31. C.P. shall mean Chromium Plated.
R.C.C. shall mean Reinforced Cement Concrete.
P.C.C. shall mean Plain Cement Concrete.
C.I. shall mean Cast Iron.
G.I. shall mean Galvanized Iron.
A.C. shall mean Asbestos Cement.
P.V.C shall mean (Unplasticised) Polyvinyl Chloride.
I.S.I. shall mean Indian Standard Institutions.
W.C. shall mean Water Closet.
I/C shall mean Including.
P/F shall mean Providing & Fixing.

LIFE INSURANCE CORPORATION OF INDIA**TECHNICAL DETAILS FOR ELECTRICAL INSTALLATION WORK****T.D. 1:**

All items of works are to be carried out strictly as per I.E. Rules, 1956, IS : 732, IS : 3943-1966 or their latest version. In case the tenderer observes any deviations in the provision made in Schedule of works vis-à-vis provision of the above given publications, he is advised to bring it out clearly while making his offer.

T.D. 2:

- a) Main switches beyond 60 Amps Ratings should be provided with H.R.C fuse units. Rewirable switch fuse units beyond 60 Amps will not be acceptable.
- b) Make :- Upto and inclusive of 60 Amps Rating as per specifications. All switches of 100 Amps rating and above – ENGLISH ELECTRIC, SIEMENS, LARSEN & TOURBO, or as specified in schedule of quantities.
- c) **Installation:** Rates quoted by the tenderer should include for the following work unless stated otherwise.
 - i) Installation of switches on slotted angle iron frame work of adequate section. The main panel board is to be installed on the floor with adequate supports from wall at the back to make the entire arrangement adequate sturdy.
 - ii) Connecting the main switch with meter, bus bar distribution board with adequate length and section of PVC Insulated leads in M.S. conduit or flexible conduits as per requirement of site.
 - iii) Labelling of the switches to indicate clearly the area or the load being controlled by them.
 - iv) Connecting the earth wire run along with mains/cables etc. to the earth line by providing a suitable socket etc.
- d) **BUS BAR:**
 - i) All bus bars are to be made of tinned copper strips of the given section.
 - ii) Unless specified otherwise all bus are to be designed taking maximum current density as 800 Amps per Sq. inch.
 - iii) All bus bars are to be covered with PVC sleeves of red, yellow, blue and black colours to indicate various phases and neutral bar clearly. Alternatively, PVC insulation tape of the afore mentioned colours is to be used for identification of phases and neutral as indicated above.
 - e) All locally fabricated elements of the Main panel board (such as angle iron fram work, bus bar chamber, distribution board etc.) should be provided with the final quote of battle ship grey paint (Synthetic enable) after erection and before commissioning and all switches, bus bars, distribution boards provided to main panel boards are to be leveled.

T.D. 3:

Contractor is to supply 'English Electric' make rising in with tap off boxes complete and other accessories like I boxes etc. Contractor's responsibility is to supply and installed the 'English Electric' rising main. Rates quoted by the contractor should include .

- a) Supplying the 'English Electric' rising main with tap-off boxes and accessories.
- b) Installing the Rising Main trunking on brackets made of M.S. Angle Iron/Flats channel section of required thickness linking of tap off boxes for floors, including grouting the brackets in the wall of the Electrical shaft. The proposed arrangement for grouting is to be got approved by LIC of India's representative for the work.
- c) Running the double run of 25mm x 3.15mm copper tape on the body of the trunking and connecting the same to earth continuity conductors run along with the cable.
- d) After installation general checking and clearing the rising mains before commissioning.
- e) Final cost of painting of shade – same as that provided on the rising main trunking including labeling.

T.D. 4:

- a) Drawing showing details of installation indicating very clearly the sections of slotted angle iron proposed to be used, the depth to which members are to be grouted inside the wall, made of their support at the floor level including grouting inside the floor should be got approved by the contractor before actual execution of work.
- b) The drawing showing the arrangement of the main distribution boards, floor distribution boards showing the actual dimensions of switchgears, bus chambers, distribution boards etc. should be got approved by the contractor before fabrication.
- c) After execution of the work the contractor has to submit completion reports with drawings of the entire installation showing the manner in which the work has been actually carried out in triplicate to LIC of India. This is in addition to the drawings which the Contractor's is requires to submit with the completion reports/tests reports he has to submit as per the requirement of local electric supply company.
- d) It is the responsibility of the contractor to attend to the inspection of the installation if carried out by the inspecting authority of the State Govt. As mentioned in T.D. 1 since the works are to be carried out strictly as per I.E. Rules and relevant Indian Standard Specifications, the defects indicated by the above given Inspecting authorities will have to be rectified by the contractor at no extra cost to LIC of India.
- e) The rates quoted by the contractor will be taken as inclusive of all services which he will be required to render to obtain electrical services connection.
- f) To the premises, in case it is observed that the contractor is lacking in efforts to obtain Electrical service to the premises, Chief Engineer at his discretion may recover liquidated damages at the rate as mentioned in clause – of the general conditions of contract for delay in availability of electrical service and consequent delay in commissioning of the installation.

- g) It will be the contractors responsibility to check the concealed conduit work carried out by the Builders contractor with in a period of one month of taking over of site and to certify that the concealed conduit work is in order. In case the contractor fails to point out any defect with in this period, it will be taken for granted that the concealed conduit work has been found by the contractor in order and no further complaints in this regard will be entertained. After this, all rectification work will have to be carried out by Electrical Contractor at his cost.

T.D. 5:

- a) Insulated cables are to be on the walls, beams, ceiling etc. by providing plugs of well seasoned wood, cemented into the walls to with in 6.5 mm of the surface. Within the electrical shaft, the cables are to be run on M.S. clamps made out of angle, channel or flat section of required thickness grouted in the walls securely. The cable trenches in the Meter room in which the cables have been laid are to be filled up with sand.
- b) The underground cable run in the trenches are to be laid in suitable dia Hume pipe at all road crossings.
- c) All cable terminations inside switches, bus bar distribution and switch boards should be made in a workman like manner by providing sockets of suitable amperage, compression glands of suitable dia, porcelain connectors etc., as required. Rates quoted should be inclusive of all these accessories and nothing extra will be considered on these counts.
- d) Measurements for mains and cables will be taken as per IS : 5908 – 1973 or latest version of it.
- e) Conduits containing PVC insulated wires for mains/sub-mains/circuits/point wiring are to be painted with 2 coats of synthetic enamel paints of British Paint/Jenson Nicholson/Shalimar/Asian brand to match with the finished wall surface. The rate quoted should be inclusive of the cost of painting as mentioned here.

T.D. 6:

- a) All rates quoted for point wiring should include for providing circuit wiring by means of 2x2.5 sq.mm PVC insulated and PVC sheathed wires.
- b) The T.W. Battens/Boards etc., are to be fixed to the wall beam/column/ceiling surfaces by means of good quality M.S. screws.
- c) The pint wiring work is to be carried out in looping back 'System of wiring' and as such wooden junction boxes are not to be used in the run of point wiring for joining point wiring conductors.
- d) The rate quoted should provide for either painting the wooden switch boards or polishing the same as per the requirement of LIC's representative.

T.D. 7:

- a) The work of providing earth electrodes is to be done strictly according to IS: 3043-1966 or its latest version.
- b) For pump motor sets pipe-electrodes are to be provided where as for other electrical installation plate electrodes are to be provided unless stated otherwise.

- c) The work of provision of earth stations should include in additions to provisions of earth electrodes bringing the earth leads out upto the panel boards in case of electrical installation and up to test terminal block installed at a height of 2.75 meters, from the ground level in case of lightning conductors. The measurement for each leads, if included in the schedule of work and payable separately will therefore, exclude the above length of earth leads.
- d) The earth electrodes are to be installed minimum 4.5 metres away from the premises

CERTIFIED

1. That the rates are quoted after actually visiting site of work and acquainting with working condition and
2. That we have carefully studied the conditions of contract and specifications for material and workmanship and will adhere to the same.

SIGNATURE OF CONTRACTOR

SPECIFICATION FOR ELECTRICAL INSTALLATION WORKS IN
LICI BUILDINGS SUBJECT TO THE GENERAL
CONDITIONS OF CONTRACT IN FORCE.

GENERAL.

1. The installations shall generally be carried out in conformity with the code of practice for electrical wiring installation (system voltage not exceeding 650 V). Viz. IS : 730-1963 of the latest revision thereof.
2. Definition : As given in I.S. code of Practice shall apply.
3. Pressure and frequency of supply : All current consuming devices shall be suitable for 433 V. three phase, 50 cycle A.C. supply.
4. System of wiring :
 - i) The wiring shall be carried out as per schedule, "Power" wiring must be in screwed conduit and shall be kept separate and distinct from lighting wiring. All wiring must be done on the distribution system with main and branch distribution boards at convenient centre and without isolated fuse. All conductors shall be run as far as possible along with walls and ceilings so as to be easily accessible and capable of being thoroughly inspected. The balancing of circuits will be arranged before hand by the Corporation Engineer.
 - ii) The Contractor shall supply within a month from the date of taking over installations to the Chief Engineer, a complete set of wiring diagrams of the installations on the drawing supplied to him for Chief Engineer's approval. The said wiring diagrams when approved by Chief Engineer shall be deemed to be 'Drawings' within the meaning of the terms as used in the general conditions of contract.
5. Conductors :

The conductors shall be of aluminum and shall be either PVC insulated or PVC sheathed. The minimum sections of conductors used for wiring of light and plug points shall be 1.5 sq.mm. Single core wires shall not be used.
6. Cables :
 - i) All cables including flexible cables used shall be ISI approved and conforming to the ISI specifications.
 - ii) Twin flexible cable shall be of minimum sectional area of 14/0.0076 and PVC insulated.
7. Rating of Lamps & Fans : In estimating the current to be carried by any conductors, glow lamps are to be rated, as of 4 and 1.25 watts per candle power for carbon and metallic filament lamps respectively where the conditions are known, otherwise at 60 watts except in the case of gas filled lamps. Ceiling fans are to be rated at 80 watts, table fans at 80 watts unless actual values are known or specified.
8. Fall of Potential :- The cross sectional area of all conductors inside buildings shall be so proportioned to their lengths that the drop in pressure between the main fuses and the furthest or any lamp shall not exceed two percent, with all the consuming devices in use.

9. Test : The installation with fittings complete shell, before current is switched on, satisfactorily pass the followings tests :-

The whole of the lamps and appliances having been connected to the conductors and all switches and fuses being 'on' a pressure not less than twice the intended working pressure subject to a limit of 500 volt shall be applied and the insulation resistance of the whole or any part of the installation to earth must not be less in Megohms than 25 divided by the number of points as defined above. With all lamps and appliances removed from the circuits a similar test between poles may be demanded provided that during the rainy season half the above test value will be accepted. Where any appliance is a motor larger than one-half B.H.P. the insulation resistance of that particular circuit must be greater than one Megohm.

10. Joints and Looping Back :- No joints shall be allowed in conductors. Neutral shall be looped from point to point whereas the live wires shall be looped in the switch board only from switch to switch.

11. Switches :

- i) All main switches (Other than those of iron clad pattern) carrying over ten amperes shall be fitted for back connections.
- ii) All switches and circuit breakers shall be constructed in accordance with the I.E.E. wiring Rules, 8th edition No. 67, provided also that springs shall be either of phosphor bronze, or if of steel, shall be copper or nickel plated, and that handles shall be so fastened that they do not tend to unscrew or become loose (see also Clause 16).

12. Control at Point of Entry of Supply :- There shall be one main switch and one main fuse on which pole of each main circuit (Other than the neutral conductor of a 3 wire circuit) at the point of entry of the supply. The switches must be linked.

13. Distribution Boards :-

- i) Main distribution board shall be metal clad and shall be provided with a iron clad switch and fuse on each pole of the circuit.
- ii) Branch distribution board shall be provided with 1 fuse for each circuit and one common neutral bar. Maximum number of points to be wired on each circuit, shall be 6.
- iii) Switches and fuses of opposite polarity shall be mounted on separate bases with a shield of non-ignitable insulating material between the bases when placed and above the other.
- iv) In wiring a branch distribution board the total number of points shall be divided as far as possible evenly between the number of ways of the board. A spare circuit shall be left for future extensions.
- v) Fuses shall be of approved materials and each circuit shall be clearly numbered from left to right in conspicuous figures to correspond with the wiring plans.
- vi) Two spare fuse carriers per main and branch board shall be supplied for replacements
- vii) All boards (other than those of iron-clad pattern) shall have strongly made, well finished any approved teak cases with dovetailed corners and shall be polished and marked with conspicuous letters on labels to correspond with the wiring plans (Clause 4 (ii)).

- viii) Except in the case of 'Iron Clad' boards, cases shall have hinged or sliding plate glass doors with glass not less than one eighth of an inch in thickness and doors must be capable of being shut when any switch is either 'On' or 'Off'.

14. i) Passing through the Walls : Except as laid down in clause 87 where conductors pass the walls, one of the following alternative methods shall be used.

A hole of suitable area shall be made in the wall through which the casing or conductor shall be carried so as to allow of an air speed of not less than one inch on three sides of the casing or conductors as the case may be, or

The conductors shall be carried in an approved heavy gauge solid drawn or lap welded conduit tube or porcelain ducts. Where the supply is alternating current, the conductors of the circuit must be bunched.

- ii) Where a well tube passes outside a building so as to be exposed to the weather, the outer end shall be ball mouthed and turned downwards.

15. Plugging Walls : Plugs for ordinary walls or ceilings shall be of well seasoned teak or other approved hard wood, not less than two inches long by one inch square on the inner end and three-fourth inch square on the outer and except for use with metal sheathed wiring (see clause 54). They shall be cemented into the walls to within one-fourth inch of the surface and remainder being finished according to the nature of surface used, with plaster, or lime punning, and to give the cement, held on the plug there must be a bunch of two opposite sides two counter-bores not less than one-half inch by one-eighth inch deep, unless otherwise similarly specified. Brass screws may be used for attaching casing or battens to the plugs. Where owing to irregular coursing or other reasons the plugging of the walls or ceiling presents difficulties, the casing, battens or conduit (as the case may be) shall be attached to the wall or ceiling in a manner approved by the Corporation Engineer.

16. Branch switches (see clause 11) - In installations supplied from a three wire system, all branch switches shall be placed on the outer wires switches (other than those multiple control) controlling not more than 10 amperes shall be of the tumbler type and the switches shall be 'ON' when the handle or knob is down. Where the specified position of branch switches is altered, any such alterations of position after fixing will be paid for.

17. Coiling Rose and Wall sockets - Ceiling roses and wall sockets shall not contain fuse terminals. Wall sockets shall comply with the requirements of the British Engineering Standards Committee.

18. Fitting - where conductors are required to be threaded through tubes or channels formed in the metal work of fittings, these must be free from sharp angles or projecting edges and of such a size as will enable them to be wired with the conductors used for the final sub-circuits without removing the brading taping or outer covering. As far as possible, all tubes or channels should be of sufficient size to permit of 'looping back'. Where with the approval of the Corporation Engineer, 'Electrolite' wire is used for wiring fittings, the sub-circuit leads must terminate in a ceiling rose or connector from which this wire will be carried into the fittings. Flexible wire must not be used for wiring fittings, except portable fittings. All fittings must have not less than a half inch male nipple. Fittings and lamp holders for gas filled lamps shall be adequately ventilated.

19. Lamp holders - Lamp holders for use on brackets, etc. shall have not less than a half inch female nipple and all those for use with flexible pendants shall be provided with cord grips. All cases must be solid and substantial, thin case export type not being admissible. Edison screw holders will not be accepted for lamps below 100 watts.

20. External and Road Lamps — External and road lamps shall have weather proof fittings of approved design so as to effectually prevent the admission of moisture. An insulating distance piece of moisture proof material must be inserted between the lamp holder-nipple and that of the fitting. Flexible cord conductors and cord grip lamp holders must not be used where exposed to the weather. In verandahs and similar exposed situations rod pendants or ceiling plates shall be used.

21. Lamps.

- i) All glow lamps unless otherwise specified in the special conditions of contract shall be hung at height of nine feet above the floor level. Metal filament lamps shall be made of drawn wire only.
- ii) When carbon filament lamps are used, they shall comply with the Engineering Standard Committee's specification for carbon filament flow lamps.

22. Fans & Regulators.

- i)
 - a) All ceiling fans shall be suspended from a hook or shackle and insulated from the same. All joints in the suspension rod shall be screwed and all joints or bolts in connection there with shall be additionally secured by means of split pins.
 - b) The canopy and wood block at the top of the suspension rod shall effectually hide the suspension.
 - c) The leading in wire shall not smaller than 3/22 S.W.G. and shall be protected from being cut.
 - d) All fans shall be free from sparking, noise, oil throwing and excessive heating.
- ii)
 - a) All fans shall be hung nine and half feet above the floor or as directed by the Corporation Engineer.
 - b) All fans shall be capable of running at full speed for one month without additional oiling and shall not overheat after eight hours continuous run at full speed.
 - c) Each fan shall have a speed regulator which shall have a cover and an 'OFF' position and shall be designed as to be capable of reducing the normal speed of the fan by not less than 60 percent with all resistance in circuit. The regulator shall be capable of continuous use on any contact without burning or overheating.

23. Attachment of fittings and Accessories :

- i) In other than conduit wiring all ceiling roses, wall-sockets, regulators, brackets, pendants, and accessories attached to walls or ceiling shall be mounted on substantial teakwood blocks twice varnished after all fixing holes are made in them. Brass screws only are to be used for attaching fittings and accessories to their base blocks.
- ii) All attachment blocks shall have solid backs not less than one-eighth inch thick.

24. Interchangeability :-

Similar parts of all the switches, lamp-holders, distribution boards, ceiling roses brackets, pendants, fans and all other fittings of the same type shall be interchangeable.

LIFE INSURANCE CORPORATION OF INDIA

ANNEXURE I

Abstract of the Wiring Rules of the Institution of Electrical Engineers, referred to in the Specification.

DEFINITIONS

(See clause 2 of specification)

SYSTEM : An electrical system in which all the conductors and apparatus are electrically connected to a common source of supply.

- 12. **EARTHED :** Connected to the general mass of the earth in such a manner as will ensure at all times an immediate and safe discharge of electrical energy.
- 14. **Un-insulated Conductor :** A conductor without provision, by the interposition of a dielectric or otherwise, for its insulation from earth.
- 15. **Bare :** Not covered with insulated material.
- 16. **Dielectric :** Any material which offers high resistance to the passage of an electric current.
- 23. **Bunched Conductors :** When more than one conductor is contained within a single duct or groove, or when they are run unenclosed and not spaced apart from each other.
- 27. **PAINT :** In wiring. (Special definition in Clause 2 of this specification).
- 30. **SWITCHBOARD :** An assemblage of switches, fuses, conductors, measuring instruments and other apparatus for the control of the electrical machinery and circuits.
- 31. **SINGLE POLE SWITCH :** A switch controlling one conductor only or circuit.
- 34. **LINKED SWITCHES :** Switches linked together mechanically so as to operate simultaneously, or in definite sequences.
- 38. **FUSE-SWITCH :** A quick-break switch with fuse, forming an integral part of the switch.
- 41. **THREE WIRE SYSTEMS :** (A) Outer conductors – These between which there is the greatest difference of potential. This use of the word outer must not be confused with the use of the word when applied to the external conductor of concentric main, (B) Neutral Conductor – That which is at a potential intermediate between the potentials of the other conductors.

47. **SEMI – ENCLOSED MACHINE :** One in which the ventilating openings in the frame are covered with :
- (a) Grids, expanded metal or wire gauze, with openings of not less than $\frac{1}{4}$ inch so as not to obstruct free ventilation,
 - (b) Wire gauge, in which the openings are less than $\frac{1}{4}$ inch but not less than $\frac{3}{32}$ inch (diameter or width),
 - (c) Screens with smaller openings than the above.
48. **TOTALLY – ENCLOSED MACHINE :** One in which the enclosing case and bearings are dust-proof, and which does not allow circulation of air between the inside and outside of the
49. **PIPE – VENTILATED MACHINE :** An enclosed machine in which the frame is so arranged that the ventilating air may be conveyed to it through a pipe attached to the frame, the ventilation being maintained by the fanning action produced by the machine itself.
50. **FORCED – DRAUGHT MACHINE :** An enclosed machine in which the ventilating air supply is maintained by an independent fan external to the machine itself.
66. **PROTECTED MACHINE :** One having end shield bearings and in which there is free access to the interior without opening doors or removing covers.

SWITCHES AND CIRCUIT BREAKERS

(See Clause II of Specification)

67. **SWITCHES AND CIRCUIT BREAKERS :** Switches and Circuit breakers (rules 2b, 36 and 37) whether fixed separately or combined with lamps, holder or fittings, must comply with the following requirements :
- (a) Overheating must not take place at the point of contact or else where, when the full current flows continuously ;
 - (b) They must be so constructed or arranged that the contacts cannot accidentally close when left open ;
 - (c) They must be incapable of forming a permanent arc when breaking circuit, and they must be tested with pressures, and currents 50 percent in excess of those which will be used on the circuits for which they are intended ;
 - (d) The bases must be of incombustible, non-conducting and moisture-proof material ;
 - (e) Circuit-breakers must be so arranged and placed so that the combustible material is endangered by their action ;
 - (f) Unless placed in an engine room or in a compartment specially arranged for the purpose, they must have their live parts covered. The covers must be of incombustible material and must be either non-conducting or of rigid-metal and clear of all internal mechanism. For more than 6 amperes, at pressures exceeding 25 volts metal covers must be lined with insulating material.
 - (g) In positions where they are liable to injury or to come into contact with goods, they must be further protected by an open fronted box or other suitable guard ;

- (h) Handles must be insulated and so arranged that the hand cannot touch live metal, or be injured through an adjacent fuse blowing ;
- (i) Switches having a handle projecting through an open slot in the cover, must not be used.

COPPER CONDUCTORS

(See Clause 5 of Specifications)

71. A. Standards :

The data for the resistance of copper conductors are based on the standards defined by the Standards Committee as follows :

- (a) At a temperature of 20° the resistance of a wire of standard concealed copper one metre in length and of uniform cross-sectional area of one square millimeter is $1/58 \text{ ohm} = 0.017241 \text{ ohm}$;
- (b) The density of commercial annealed copper at 20°C. Is 8.89 grams per cubic centimeter;
- (c) A variation of 2 percent from the adopted standard of weight is allowed in all conductors;
- (d) An allowance of 1 percent increased resistance, as calculated from the diameter, is allowed in all tinned copper conductors between diameters 0.118 and 0.078 inch inclusive ;
- (e) For the purpose of calculation of tables, a lay, involving an increase of 2 percent, in each wire, except the centre wire, for the total length of the cable is taken as the standard ;
- (f) The legal standard wire gauge, as fixed by order in Council, dated August 23, 1882, is adopted as the standard for all wires.

FLEXIBLE CONDUCTOR

(See Clause 6 of Specification)

72. B. Size :

As per Tables III and IV (not reprinted).

77. A. VULCANISED RUBBER :

Vulcanized rubber flexible must be insulated with one layer of pure rubber and two layers of vulcanized rubber ; the minimum insulation resistance and radial thickness of the dielectric must be those specified in the British Standard Specification No. 7. The dielectric shall be suspended by a layer of tape and the whole shall be vulcanized together. In the case of cables having an outer protective covering of tough rubber (See regulation 83) the tape may be omitted.

79. B. SULPHUR :

Insulating material containing sulphur must not be in direct contact with copper wire (rule 41.).

84. **DIELECTRIC AND TESTS :** The insulating material used as the dielectric must be pure rubber equal to washed Para rubber or vulcanized rubber of the best quality. The pure rubber must be laid on the two layers, care being taken that the edges of each layer overlap, and the radial thickness of the dielectric must not be less than 20 mils. Each coil of pure rubber flexible must be tested, in air for 15 minutes with a pressure of 1,500 volts alternating between the conductors at a frequency of 50 to 100.

BUNCHING

(See Clause 28 of Specification)

90. **BUNCHING :** Where protected from mechanical injury by metal conduits or by a covering of tough rubber compound (rule 65) conductors of opposite polarity may be bunched. Where the protecting tubing or casing is non-metallic, lengths of conductors of the same polarity and free from joints carrying small currents for incandescent lighting, from sub-centres, as in rule 95 may be bunched. If the supply is alternating and the protection iron or steel, the lead and return conductors must be bunched.

CURRENT IN CIRCUITS AND SUB-CIRCUITS

(See Clause 13 of the Specifications)

95. (Part only): For lighting purpose, in any final sub-circuit which supplies more than a single point, the current must not exceed 6 amperes for pressures up to 125 volts, not the power 600 watts from 125 to 250 volts and the maximum number of points on any sub-circuit must not exceed ten.

SPECIAL CONDITIONS & TECHNICAL SPECIFICATIONS FOR ELECTRICAL WORKS

SPECIAL CONDITIONS

1. SCOPE OF WORK

In general the work to be carried out under this contract shall be as specified in the specifications, detailed in the schedule of quantities, shown in the drawings and generally shall comprise of supply and installation of the following :-

- a. Wiring for lights, fan points, power outlets, special power wirings etc.
- b. D.B.'s, Main boards, floor boards.
- c. Mains, submains and power cables.
- d. Earthing.
- e. Lighting protection.
- f. Supply of fittings and fans.
- g. Erection of fittings and fans.

2. SPECIFICATION AND STANDARDS

Specifications applicable to this work shall be as per Indian Standard Specifications and specifications laid in National Electrical code unless otherwise specified in the description of items, given in the schedule of quantities or in the special conditions and/or Technical Specifications. Requirements or these specifications shall be fulfilled by the contractor within the tendered rates. Item rates quoted shall be deemed to have taken these specification into account.

3. In the interpretations of specifications or items where descriptions are conflicting or incomplete or otherwise subject to dispute, the following order of decreasing importance shall prevail.

1. Description of item in the schedule of quantities.
 2. Specifications attached to the tender.
 3. Indian Standard Specifications.
- Anything not covered by the above shall be as per I.E. Rules & Regulations.

4. ALTERATIONS

If any minor alterations are found necessary, the contractor will carry out the same with the prior approval of the Chief Engineer

5. WORKMAN – SHIP

The work will be carried out in the best workman like manner and any defect in the work or changes in the design etc., if pointed out, shall be carried out by the contractor within the tendered rates.

6. EMPLOYMENT OF SUPERVISORS/WORKERS.

The contractor shall employ adequate skilled and unskilled workmen to complete the work within the stipulated time and make his own arrangements for storage of materials etc. A whole time Electrical Engineer/Supervisor shall be deputed by the contractor who shall remain at site of work to receive orders or any other instructions from the Architects/Engineer-in-Charge.

7. MATERIAL SUPPLIED BY THE OWNER :

Any material supplied by the employers to contractor for erection, if damaged in any way during cartage or execution of work or otherwise, shall be made good by the contractor at his own cost.

8. CONTRACTOR'S RESPONSIBILITY.

During the progress of work, completed portions of the bldgs. may be occupied and put to use by the owner but contractor will remain fully responsible for maintenance of the electrical installation till the entire work covered by this contract is satisfactorily completed by him and taken over by the owner.

9. CONTRACTOR TO OBTAIN INFORMATION HIMSELF.

The contractor shall obtain for himself, on his own responsibility and at his own expenses all the information which may be necessary for the purpose of tendering and for entering into a contract, and must examine and study the specifications, inspect the site, the building and electrical plans etc. The contractor shall also not withstanding any information given to him, make local and independent enquiries.

10. Tender Rates.

All rates tendered will include for the cost of material, connections, labour, supervision, tools, plants, transport, all taxes, contingencies, breakage, wastage, sundries scaffolding and they should be for an item complete in all respects.

11. Approvals.

The contractor, while executing the work, shall conform to the provision on any Government Act relating to the work and to the regulations and Bye Laws of the local authorities, and of the company to whose system of supply the installation is proposed to be connected. The contractor shall give all notices, required by the acts, regulations or certificates and drawings as required and will make necessary arrangements to procure electricity supply without any extra charges. The contractor shall also obtain all approvals from appropriate authorities for the items of work done under this contract. All inspection fees or submission fees paid by the contractor will be reimbursed by the owner against valid official receipts. Contractor shall possess or shall employ a sub-contractor who possesses a valid Electrical Contractor's License issued by the inspectorate of the local government. The contractor shall file applications and follow up with electricity supply company for the sanction of power supply and commissioning of the electrical installations. preparation of drawings in consultation with the Architects (if any). Approval of drawings, and installation etc. shall be arranged by the contractor. All incidental charges/expenses associated with the above work shall be borne by the contractor.

12. Samples and Fabrication Drawings :

Samples of materials and fabrication drawings will be submitted by the contractor according to the schedule/specification. Any deviation from the schedule/ specification will have the written consent of the Executive Engineer Elect. However, approval given by the Executive Engineer Elect. To any samples or drawings submitted by the contractor shall in no way exonerate the contractor from his liability to carry out the work in accordance with the terms of the contract.

13. Working Drawings :

The contractor will submit four sets of working drawings indicating detailed layouts for approval at least two weeks in advance and proceed with work then after. All fabrications drawings and other literature will also be submitted in advance for approval. These drawings shall indicated conduit layout, location of DB's Meter Boards, Main Boards, cables, earthing and all other systems etc. as required for execution. Work at site shall commence only after the conduit layout drawings and all fabrication/work shop drawings have been approved.

14. Completion Drawings.

The contractor shall submit one complete set of Original Tracing and further two copies of layout drawings to the Executive Engineer after completion of the work. These complete drawings shall give the following information.

- a. Layout of Lighting and Power Wiring.
- b. Location of DB's, MB's, submains cables and earthing.
- c. Junction boxes, drawboxes and dummy conduits for telephones, fire alarm and other systems.
- d. Schematic diagram and shall indicate all systems that are covered in the scope of this work. No completion Certificate will be issued until the drawings in the above mentioned form are submitted. The drawings will be prepared and submitted by the contractor without extra charge.

15. Progress and time completion.

The work will commence immediately after the contractor receives instructions to proceed and will ensure that the work is completed within the stipulated period. Electrical work shall be carried out simultaneously with building and other works. The contractor will work in co-operation with the building contractor and other contractors and shall arrange to place the conduits in the masonry and concrete work as the building or other work proceed. Any hold up in the building or other works because of delay in laying of conduits or otherwise, shall be the responsibility of the Electrical contractor and will make him liable for damages, if any, by the Employers.

The contractor shall in consultation with the Executive Engineer Elect. Draw up a time schedule before commencement of the work. This time schedule will be strictly adhered to.

16. Defect Liability Period.

The completed installation shall not be finally taken over and acceptance certificate issued to the contractor until the expiry of defect liability period of one year. The contractor shall be liable for :

- a. The replacement of any defective parts that may develop in goods of his own manufacture or supplied by him.

- b. The rectification of all the defects arising out of defective workmanship of the contractor
- c. Bringing to the notice of Engineer-in-Charge any defect arising in materials supplied by the owner. The owner shall provide replacement of such material.
Until the installation is finally taken over, the contractor shall have the right of entry to the premises at his own risk and expenses for maintaining of the installation in proper order.

17. Painting and Marking.

All exposed steel work will be painted with one coat of primer and two coats of synthetic enamel paint in shades approved by the Engineer-in-Charge. This work will be done by the contractor without extra charge. All DB's, Main Boards, Meter Boards etc. shall be marked/number to indicate the area they control.

18. Conduits for various systems.

Separate and independent conduits will be laid for each systems such as lighting, power normal and essential DG set supply, telephones, TV etc. conduit less than 20mm in diameter shall not be used.

19. Inspection.

During production and prior to dispatch of equipment, contractor shall provide and secure every reasonable access and facility of inspection for Dy. Chief Engineer & his representative if so desired.

20. System of Wiring.

In any system of wiring no joints shall be made at intermediate points in the through run of cables unless the run of the final circuit, sub mains, mains etc. exceeds the length of standard coil as manufactured by the manufacturer of the cables.

21. Point Wiring.

In case of recessed conduit system, the point shall be completed with conduit including accessories and cables, necessary junctions outlets and switches, boxes, connector, wherever required necessary earthing, connections and ceiling rose.

a. The point shall commence from the distribution board including circuits each having independent neutral wires and shall end up to the outlet through control switch.

b. Installation shall be carried out in conformity with the ISI codes of practice, Indian Electricity Rules.

c. The convenience outlet socket points shall be completed with 2/3 pin socket enclosed in a sheet steel box with the controlling switch as required and third pin shall be earthed.

22. Junction and Pull Boxes.

Junction and Pull boxes of required sizes and ways shall be of sheet steel boxes.

23. Quantities.

Quantities indicated in the schedule are approximate and subject to wide variations.

24. Approved materials.

List of approved makes and manufacture of Electrical materials is attached. Only such materials as are on this list shall be allowed to be used. If contractor wishes to use any other materials not on the list, he must obtain permission of the Engineer-in-Charge in writing. He must furnish samples/literatures of items to Engineer-in-Charge in advance for approval. Materials to be used for particular item of work shall be of one brand throughout project and shall be ISI marked. Those materials for which ISI certificates are not issued, these shall have approval of Architects/owners in advance.

TECHNICAL SPECIFICATIONS**1. INTRODUCTION.**

The electrical installation shall be carried out in accordance with the specifications given hereunder and shall be in conformity with Indian Electricity Act 1910 as amended, Indian Electricity Rules 1956 as amended upto date relevant Indian Standard Code of Practice for electrical installations in Buildings, supplementary regulations of State Electricity Departments and electricity undertakings/Boards concerned, Delhi Electric Supply undertaking, Delhi Development Authority, Municipal Corpn. Of Delhi and any other concerned Authority. Where these specifications call for higher standards, these specifications shall be followed.

The general safety precautions as specified, in the IS code No. 5216/1969 "Code for safety procedures and practice in Electrical Works" shall be followed.

2. DEFINITIONS AND CONVENTIONAL SYMBOLS.

The definitions of terms shall be in accordance with Indian Standard Code of practice for electrical wiring installation IS 732/1963. The signs and symbols specified in IS Code 732/1963 shall be followed unless indicated otherwise in the drawings.

3. POINT WIRING.

Point wiring shall include all works necessary to complete the pint from distribution board upto outlet including circuit wire unless mentioned otherwise in the schedule of quantities, and shall include, conduit, outlet boxes, switch/push button, cover plate, wires, earth wire connectors etc.

4. SUB MAIN WIRING.

Sub Main wiring shall mean length of wiring from one main/distribution switch gear to another main/distribution switch gear measured along the run of wiring. Such wiring shall be measured on linear basis and will include conduit pipe with accessories, junction/draw/pull boxes with covers, wires etc. as detailed in the item. Measurements will be from end to end of conduit, exclusive of interconnections in the switch board etc.

5. SYSTEM OF WIRING.

Wiring shall be carried out in such a system as specified in the tender, schedule or otherwise in specifications. Power and heating wiring shall be kept separate and distinct from lighting and fan wiring. All conductors shall run as far as possible along the wall and ceiling so as to be easily accessible and capable of being thoroughly inspected. In no case open wiring shall be run above false ceiling. Due consideration shall be given for neatness, good appearance and safety.

6. CABLES.

All cables shall conform to relevant Indian Standards. Conductors of all cables shall be copper as indicated in the schedule. Smallest conductor to be used shall have nominal cross sectional area of not less than 1.0 sq.mm for light points and 4 sq.mm. for power points or as specified. Stranded conductor cables shall be used if so specified in the schedule of quantities.

7. JOINTS AND LOOPING BACK.

Wiring shall be done in the looping system. Phase or live conductors shall be looped at the switch box and neutral conductor can be looped outlet to outlet.

8. MARKING OF APPARATUS.

Switchgears shall be marked such as to indicate section of installation thus controls. All distribution boxes shall be marked lighting and power as the case may be and also marked with pressure and number of phase of supply. Each shall be provided with a circuit list giving details of circuit it controls.

9. COMPLETION TESTS.

On completion of installations the following test shall be carried out :

- a. Insulation resistance test.
- b. Polarity test of switch.
- c. Earth continuity Test.

a. INSULATION RESISTANCE TEST.

The insulation resistance shall be measured by applying between earth and the whole system of conductors or any section thereof with all fuses in place and all switches closed, and except in earthed concentric wiring all lamps in position or both poles of the installation otherwise electrically connected together, a direct current pressure of not less than twice the working pressure provided that it need not exceed 500 volts for medium voltage circuits. Where the supply is derived from the three wire D.C. or a Polyphase AC system, the neutral pole of which is connected to earth either direct or through added resistance the working pressure shall be deemed to be that which is maintained between the phase conductor and the neutral. The insulation resistance shall also be measured between all metallic (if used) conduits connected to one pole or phase conductor of the supply and all conductors connected to the Neutral or to the other pole or phase conductors of the supply with all lamps in position and switches in "OFF" position and its values shall be not less than that specified below. The insulation resistance is mega ohms measured as above shall not be less than 50 mega ohms divided by number of outlets.

A preliminary and similar test may be made before lamps etc. are installed in this event the insulation resistance to earth should not be less than 100 mega ohms divided by the number of outlets or when PVC insulated cables are used for wiring, 25 mega ohms divided by the number of outlets.

b. POLARITY TEST OF A SWITCH

i. In a two wire installation a test shall be made to verify that all switches in every circuit have been fitted in the same conductor throughout and such conductor shall be labeled or marked for connection to the non earthed conductor of the supply.

ii. In a three wire or four wire installation a test shall be made to verify that every non linked single pole switch is fitted in a conductor which is labeled or marked for connection to one of the phase conductor of the supply.

iii. The installation shall be connected to the supply for testing. The terminals of all switches shall be tested by a lamp, one lead of which is connected to earth. Glowing of test lamp to its full brilliance, when the switch is in "ON" position irrespective of appliance in position or not shall indicate that the switch is connected to the right polarity.

c. EARTH CONTINUITY TEST.

The earth continuity conductor including metal conduits and metallic envelops of cables in all cases shall be tested for electric continuity and the electrical resistance of the same along with the earthing lead but excluding any added resistance of earth leakage circuit breaker measured from the connection with the earth electrode to any point in the earth continuity conductor in the completed installation shall not exceed one ohm. The contractor shall notify in writing to the Architect/Engineer-in-Charge about the completion of the work. Within 30 days from the date of this notification, the Architects/Engineer-in-Charge may send their representative to remain present at the time of carrying out of the tests by the contractor if so desired. The Architects/Engineer-in-Charge for such tests.

Should the above tests not comply with the limits and requirements as above, the contractor shall rectify the faults until the required results are obtained.

The contractor shall be responsible for providing the necessary instruments and subsidiary earths for carrying out the tests. These tests shall be carried out by contractor without any extra charges.

10. BUNCHING OF CABLES

Cables carrying direct current, may if desired be bunched whatever their polarity, but cables carrying alternating current, if installed in metal conduit shall always be bunched so that the outgoing and return cables are drawn in the same conduit.

11. PAINTING OF ACCESSORIES.

After installation, all accessible surface of metal conduit pipes, fittings, switch and regulator boxes etc. shall be painted with one coat of primer and two coats of synthetic enamel paint.

12. OUTLETS/BOXES.

The switch or regulator box shall be made of metal on all sides, except on the front and shall be MS. materials. In case of welded mild steel sheet boxes the wall thickness shall not be less than 1.6mm for boxes. Except where otherwise stated 3mm thick phenolic laminated sheets shall be fixed on the front with brass screws. Clear depth of the box shall not be less than 60mm, and this shall be increased suitably as required. All fittings shall be fitted in flush pattern.

13. TYPE AND SIZE OF CONDUIT.

All conduit pipes shall be approved gauge (not less than 1.6mm thick sheet for conduits of size upto 32mm diameter and not less than 2mm thick sheet for conduits of size above 32mm diameter solid drawn or reamed by welding finished with stove enameled surface. All conduit accessories shall be threaded type and under no circumstances pin grip type or clamp grip type accessories shall be used. The maximum no. of VIR/PVC insulated 250 volt grade copper conductor cable that can be drawn in one conduit of various size shall be as given in table of CPWD specifications 1972 for internal Electrical works and the number of cables per conduit shall not be exceeded.

ERECTION OF CONDUIT.

The conduit of each circuit or section shall be completed before conductors are drawn in.

14. LAYING CONDUITS IN SLAB/FALSE CEILING.

Conduit shall be laid in the slab before casting and shall be adequately secured to the reinforcement to avoid displacement conduits when laid above false ceilings shall be properly fixed/secured with saddles. Wherever conduits are laid in the floor, these shall be properly embedded and covered with 1:8 cement and mortar.

15. MAKING OF CHASE.

The chase in the wall shall be neatly made and of ample dimensions and be 50mm deep to permit the conduit to be fixed in the manner desired. In the case of bldg. under construction, conduits shall be buried in the wall before plastering and shall be finished neatly after erection of conduit. In case of exposed brick/rubble masonry work, special care shall be taken to fix the conduit & accessories in position along with building work.

16. FIXING OF CONDUIT IN CHASE.

The conduit pipe shall be fixed by means of staples or by means of saddles not more than 60cm apart or by any other approved means of fixing. Fixing of standard bends shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with a long radius which will permit easy drawing in of conductors. At either side of bend, saddles/staples shall be fixed at a distance of 15cm on either side from the centre of the bend.

17. INSPECTION/DRAW/PULL BOXES.

Suitable MS inspection boxes to be barest minimum requirements shall be provided to permit periodical inspection and to facilitate replacement of wires, if necessary. These shall be mounted flush with the wall/ceiling and covered with 3mm thick egg white hylam cover plates. Suitable ventilating holes shall be provided in the inspection box covers if so directed.

18. LAYING OF CONDUITS IN FLOOR/FILLING.

Conduits laid in floor/filling shall be covered with 1:3 cement mortar to prevent damage/displacement.

19. TYPES OF ACCESSORIES TO BE USED.

All outlets such as switches, wall sockets etc. will be flush mounting type as specified in the specifications.

20. CONDUIT JOINTS.

Conduit pipes shall be joined by means of screwed couplers and screwed accessories only. In long distance straight run of conduit inspection boxes at reasonable intervals shall be provided. Threaded portion shall be treated with anti-corrosive preservative. Threads on conduit in all cases shall be between 13mm to 19mm long sufficient to accommodate pipes to full threaded portion of couplers or accessories. Cut ends of conduit pipes shall have no sharp edges nor any burrs left to avoid damage to the insulation of conductors while pulling them through such pipes. Conduit terminating in the switch boxes, distribution boards shall be secured with check nuts and PVC/nylon bushes installed at ends. The Engineer-in-Charge with a view to ensuring that the above provision has been carried out may require that the separate lengths of conduit etc. after they have been prepared shall be submitted for inspection before fixed.

21. PROTECTION OF CONDUIT AGAINST RUST.

The outer surface of conduit including all bends, union, tees, junction boxes, etc. forming part of the conduit system shall be adequately protected against rust where system is exposed to weather by being painted with two coats of oxide paint applied before they are fixed. In all cases, no bare threaded portion is treated with anti-corrosive preservative or covered with approved plastic compound.

22. SWITCH BOARDS (SHEET STEEL CUBICLE PATTERN)**i. CONSTRUCTION.**

Switch boards shall be sheet cubicle, indoor, floor wall mounting, free standing type. The design shall be totally enclosed, completely dust tight and vermin proof. The sheet steel used shall be 2mm thick gauge. Gaskets shall be used between adjacent units and beneath all covers to render the joints effectively dust proof.

A base channel of 50mm x 25mm fabricated out of 3mm thick rolled sheet steel, painted black shall be provided to prevent corrosion of the sheet steel cubicle and to facilitate cleaning of floors.

The switch boards be easily extensible, the arrangements shall be logical, compact and neat.

The switch board shall have uniform height through its length. Barriers shall be provided between the modules to accommodate equipment associated with outgoing circuits. All modules shall have a covering at the bottom so that entry of rats and vermin is not possible.

ii. FEEDER ARRANGEMENTS

The switch boards shall be of single front construction and equipment shall be mounted on the front only. Switch boards shall be of dead front type. All switches, push buttons etc. shall be operatable from the front. The rating of switches, fuses, contactors etc. shall be as specified. Out going feeders shall be neatly arranged in different compartments. Normally equipment for individual feeders shall be accommodated in separate modules.

The frame work shall house the switches, switch-fuse units, starters and contactors, MCBs and MCCBs etc. in multi tier formation. The equipment shall be mounted independent of the back plate and not on the rear surface of the housing. Each module shall be held securely against sponge rubber gaskets to make the equipment dust tight. All hinged doors shall be provided with insulated thumbdraws.

The compartment doors shall be so inter locked that it shall not be possible to open the door when the switch is in closed position.

iii. BUS BAR.

Three phase (and neutral) copper/aluminium bus bars shall be of the incoming switch current rating and shall be housed in separate bus bar chambers. Bus bars shall be supported on unbreakable non hygroscopic hylam supports rigidly held to the frame work of the chamber. Current density of bus bar shall not exceed 0.8 amps. Per mm² in case of aluminum. Bus bar chamber shall have colour-coding to identify the various phase of the bus bars.

iv. CABLE COMPARTMENT.

A cable compartment running along the vertical module shall be provided for easy termination of all incoming and outgoing cable entering either from top or bottom.

Adequate supports shall be provided for the cables where necessary. The cable compartment shall have its own screwed removable cover for easy access during cabling.

v. CONTROL WIRING.

All control wiring shall be carried out through the common vertical compartment. In case wires are required to cross the bus bar chamber such crossing shall be carried out in neat bunches. Control wiring shall be done by PVC insulated wires of minimum size 1.5 Sq.mm copper. All control wiring shall be fitted with identification ferrules at each end. Not more than two connections shall be made at any one terminal. The wires shall be arranged and supported in such a manner that there shall be no strain on terminations. The terminations shall be of adequate current rating and size to suit individual feeder arrangements. Power terminals shall be pressure clamp type suitable for copper/aluminium wires. For connections above 63A/35 Sq. mm cable lugs shall be used.

These cable lugs shall be mounted in such a manner as to facilitate cable connections.

vi. CABLE ENTRY.

Cubicles shall be designed to facilitate aluminium conductor PVC cable entry from top/or bottom as the case may be. Removable sheet plates shall be fitted at the top and bottom to drill holes for cable entry at site.

vii. PAINTING.

All steel works shall be painted in approved shade as required.

ERECTION OF BOARDS.**i. STORING.**

The panels shall be stored in a well ventilated, dry places, suitable polythene covers shall be provided for necessary protection against moisture.

ii. ERECTION.

Switch boards shall be installed on suitable foundation. Foundation shall be as per the dimensions supplied by the panel manufacturers. The foundation shall be flat and level. Suitable grouting holes shall be provided in the foundation. Suitable MS base channel shall be embedded in foundation on which the panel can be directly installed. The switch boards shall be properly signed and bolted to the foundation.

iii. PRE COMMISSION TESTS.

Panels shall be commissioned only after the successful completion of the following test. The tests shall be carried out in the presence of Engineer-in-Charge.

- a. All main and auxiliary bus bar connections shall be checked and tightened.
- b. All wiring terminations and bus bar joints shall be checked and tightened.

- c. Wiring shall be checked to ensure that it all according to the drawing.
- d. All wiring shall be tested for insulation resistance by a 1000 volt megger.

24. EARTHING.

Earthing shall conform to the following specifications for other details not covered in this specification IS 30-1966 shall be referred to (Code of Practice for earthing).

PLATE EARTH ELECTRODE.

For plate electrodes minimum dimensions of the electrodes shall be as under :

- i. Copper plate electrodes 60cm x 60cm x 3mm thick. The electrode shall be buried in ground with its faces verticals and top not less than 3 m below ground level.

METHOD OF INSTALLING WATERING ARRANGEMENTS.

In the case of plate electrode, a watering pipe of 20mm dia of medium class GI pipe shall be provided and attached to the electrode. A funnel with mesh shall be provided on the top of this pipe for watering the earth. The watering funnel attachment shall be housed in masonry enclosure of not less than 30cm x 30cm x 30cm.

A cast iron / MS frame with cover having locking arrangement shall be suitably embedded in the masonry enclosure.

LOCATION OF EARTH ELECTRODE.

Normally an earth electrode shall be situated less than 1.5 m from any building. Care shall be taken that the excavations for earth electrode may not affect the column footings or foundations of the building in such cases electrodes may be further away from the building.

The location of the earth electrode will be such where the soil has reasonable chance of remaining moist, as far as possible entrances, pavements and roadways, are definitely avoided for locating the earth electrode.

METHOD OF CONNECTING EARTHING LEAD TO EARTH ELECTRODE.

In the case of plate earth electrode the earthing lead shall be securely bolted to the plate with two bolts, nuts, check nuts and washers.

All materials used for connecting the earth lead with electrode shall be tinned brass in cases of copper plated electrode.

The earthing lead shall be securely connected at the other end of the main board.

Loop earthing shall be provided for all mounting of main board and other metal switches and distribution fuse boards with not less than 14 SWG copper wire.

The earthing lead from electrode shall be suitably protected from mechanical injury by 15mm dia GI pipe in case of wire and 40mm dia medium GI pipe in case of strip, portions of this protection pipe within ground shall be buried at least 30cm deep (to be increased to 60cm in case of road crossing and pavement). The portion within the building shall be recessed in walls and floors to adequate depth.

In all cases the relevant provisions of Rule 33, 61 and 67 of Indian Electricity Rules 1956 as amended shall be complied with. Metallic covers or supports of all medium pressure or HT apparatus or conductors shall in all cases be connected to earth by not less than two separate and distinct earth electrodes. No earth electrode shall have greater ohmic resistance than one ohms as measures by an approved earth testing apparatus.

25. CABLE WORK, STORAGE AND HANDLING.

Cable drums shall be stored on a well drained, hard surface preferably of concrete, so that the drums do not sink in the ground causing rot and damage to the cable drums.

During storage periodical rolling drums once in 3 months through 90 degree shall be done especially in the case of paper insulated cables. Rolling shall be done in the directions of the arrow marker on the drum.

It should be ensured that both ends of the cable are properly sealed to prevent ingress/absorption of moisture by the insulation. Protection from rain and sun is preferable. Sufficient ventilation between cable drums, should be ensured during storage. The drums shall always be rested on flanges and not on flat sides. While removing cables the drums shall be properly mounted on jacks or on a cable wheel or any other suitable means making sure the spindle, back etc. is strong enough to take the weight of drum. The cables shall not be bent to a sharp to a small radius. The minimum safe bending radius for all types of PVC cables shall be taken as 12 times the overall diameter of the cable. Wherever practicable, larger radius should be adopted. At joints and terminations, the bending radius of individual cores of multi core cable shall not be less than 15 times its over all diameter.

Cable with links and straight ended links or with similar apparent defects like defective armoring etc. shall not be installed.

26. INSTALLATION.

The cable installation including necessary joints shall be carried out in accordance with the specifications given herein. For details not covered in the specifications, I.S. 1253-1967 shall be followed.

Before the cable laying is undertaken, the route of the cable shall be decided by the Engineer-in-Charge. While shortest practicable route should be preferred, cable runs shall generally follow fixed developments such as roads, foot paths, etc. with proper offsets so that future maintenance, identification etc. are rendered easy. Cables of different voltages and also power and control cables should be kept in different trenches with adequate separation, where available space is restricted. LV/MV cables shall be laid above HV cables. Where cables one another, the cable of higher voltage shall be laid at a lower level than the cable of lower voltage.

LAYING DIRECT IN GROUND.

A. Width of trench shall first be determined on the following basis :

i. The minimum width of trench for laying single cable shall be 35cm.

ii. Where more than one cable is to be laid in the same trench in horizontal formation, the width shall be increased such that the inter axial spacing between the cables, except where other specified shall be at least 20cm.

iii. There shall be a clearance of at least 15cm between axis of the cables and the sides of trench.

B. Depth of Trench:

The depth of trench shall be determined on the following basis :

- i. Where cables are laid in single tier formation, the total depth of trench shall not be less than 75cm for cables upto 1.1 KV and 1.2 m for cables above 1.1 KV.
- ii. When more than one tier of cables is unavoidable and vertical formation of laying is adopted, depth of trench in (i) above shall be increased by 30cm for each additional tier to be formed.

C. EXCAVATION OF TRENCHES :

The trenches be excavated in reasonably straight lines, wherever there is a change in direction suitable curvature shall be provided which shall be gradual. Excavation should be done by any suitable means – manual or mechanical. The excavated soil shall be stacked firmly by the side of the trench such that it may not fall back into the trench.

Existing properly exposed during trenching shall be temporarily supported or propped adequately as directed by the Engineer-in-Charge. The trenching in each cases shall be done in short length, necessary pipes laid for passing cables therein and the trench refilled.

If there is any danger of trench collapsing or endangering adjacent structure, the sides shall be well shored up with timbering and/or sheeting as excavation proceeds. Where necessary, these may even be left in places when back filling the trench. The bottom of the trench shall be in level and free from stone, brickbats etc. The trench shall then be provided with a layer of lean, dry sand cushion of not less than 8cm in depth.

D. LAYING OF CABLE IN TRENCH.

The cable drum shall be properly mounted on jacks or on a cable heel at a suitable location, making sure that the spindle is horizontal in the bearings so as to prevent the drum creeping to one side while rotating.

The cable shall be pulled over rollers in the trench steadily and uniformly without jerks and strains. The entire cable length shall as far as possible be payed off in one stretch. However, where this is not possible the remainder of the cable may be removed by 'Flanking' i.e., by making one long loop in the reverse direction.

For short runs and sizes upto 50 sq.mm of cables upto 1.1 KV grade, any other suitable method of direct handling and laying can be adopted with the prior approval of the Engineer-in-Charge. When the cable has been properly straightened, the cores are tested for continuity resistance and the cable is less then measured. The ends of all lead sheathed cables shall be sealed with solder immediately. In case of PVC cables, suitable moisture seal tape shall be used for this purpose.

Cable laid in trenches in a singly tier formation shall have a covering of clean and dry sand of not less than 17 cms., above the base cushion of sand before protective cover is laid.

In case of vertical multi-tier formation after the first cable has been laid a sand cushion of 30cm shall be provided over the initial bed before the second tier is laid. If additional tiers are formed, each of the subsequent tiers also shall have a sand cushion of 30 cms as stated above. The top most cable shall have a final sand covering not less than 17cms before the protective cover is laid. At the time of original installation, approximately 3m of surplus on each side of underground joints (Straight through/Tee/Termination and at entire and places as may be decided by the Engineer-in-Charge. The surplus cable shall be left in the form of loop. Where there are long runs of cable length, loose cables may be left at suitable intervals as specified by the Engineer-in-

Charge: Unless otherwise specified, the cables shall be protected by second class bricks of not less than 20cm x 10cm x 10cm (nominal-size) as per CPWD Building specification for protection covers placed on top of the sand (bricks to be laid widthwise for the full length of the cable to satisfaction of the Engineer-in-Charge. Where more than one cable is to be laid in the same trench, this protective covering shall cover all the cables and project at least 5cm over the side of the end cables.

BACK FILLING

The trenches then shall be backfilled with excavated earth free from stones or other sharp edged debris and shall be rammed and watered if necessary, in successive layers not exceeding 30cm. Unless otherwise specified, a crown earth not less than 50mm in the centre and tapering towards the side of the trench shall be left to allow for subsidence. The crown of earth however should not exceed 10cms so as not to be hazard to vehicular traffic. The temporary reinstatement of roadways should be inspected at regular intervals, particularly during the wet weather and any settlement should be made good by further fillings as may be required. After the subsidence has ceased, trenches cut through road ways or other paved areas shall be restored to the same density and material as the surrounding area and repaved in accordance with the relevant CPWD building specifications to the satisfaction of the Engineer-in-Chief.

Where road beams or lawns have been cut out or kerb stone displaced, the same shall be repaired and made good to the satisfaction of Engineer-in-Charge and all surplus earth rack removed to places as specified.

ROUTE MARKERS AND IDENTIFICATION TAGS.

Route markets shall be provided along straight runs of the cables at locations approved by the Engineer-in-Charge and generally at interval not exceeding 100 m. Markets shall also be provided to identify the change in the direction of the cable route and also for locations of every underground joint. Wherever more than one cable is laid/run side by side marker tags as approved inscribes with cable identification details shall be permanently attached to all the cables in the manhole put pits/joint pits/entry points in buildings/open ducts/Trays etc. These shall also be attached to various cables laid direct in ground at suitable intervals as decided by Engineer-in-Charge before the trenches are filled-up.

LAYING IN PIPES/CLOSED DUCTS:

In location such as road crossing entry to buildings, on poles, in paved areas etc. cables shall be laid in pipes or closed ducts. Stoneware pipes, GI, CI or spun reinforced concrete pipes shall be used for such purposes.

Pipes shall be continuous and clear of debris or concrete before cable is drawn. Sharp edges at ends shall be smoothened to prevent an injury to cable insulation or sheathing.

Pipes for cable entries to the building shall slope downwards from the building and suitable sealed to prevent entry of the water in the building. Further the mouth of the pipes at the building end shall be suitably sealed to avoid entry of water. Cable grips/draw wires and winches etc. may be employed for drawings cables through pipes/closed ducts etc.

LAYING OF SURFACE.

The cables may be laid in through trays or brackets at regular intervals or directly cleated to walls/ceiling. When laid over bracket supports the cables shall be clamped to prevent undue sag. Cable clamps shall be made from material such as mild steel, porcelain, wood, aluminium etc. In case of single core cable the clamps shall be non-magnetic material. A suitable non-corrosive packing shall be used for clamping unarmored cables, to prevent damage to the cable sheath.

JOINTING TERMINATION.

Jointing work shall be carried out only by a licensed/experienced cable joiner. Sufficient surplus ventilation shall be provided during jointing operation in order to disperse fumes given out by fluxing. Jointing materials and accessories like conductor ferrules, solder flux and protective tapes filling compound, jointing boxes etc. of right quality and correct sizes, conforming to relevant Indian Standards, wherever they exist shall be used. The design of the joint box and the composition of the filling compound shall be such as to provide an effective sealing against entry of moisture in addition to affording proper electrical characteristic to joints.

Where special type of splicing connector kits or epoxy resin spliced joints are specified, materials approved for such application shall be used and instructions of the manufacturer/supplier of such materials shall be strictly followed.

Insulation resistance of cables to be jointed shall be measure with 500 v megger upto 1.1 KV grade and with 2500/5000 V megger for cables of higher voltage. Unless the insulation resistance values are satisfactory, jointing shall not be done. Whenever aluminium conductor is exposed to outside atmosphere a highly tenacious oxide film is formed which makes soldering of aluminium conductor difficult. The oxide film should be removed using appropriate tape of flux.

CABLE TRAYS.

Cable trays shall be made of CRC sheet 1.8mm thick and of the sizes as specified in the schedule of quantities and marked on the drawings. Final routes shall be marked and ascertained at site in consultation with the Engineer-in-Charge. Installation of cable trays shall include all hard wares including suspension rods of 10mm MS rods. Each run of cable tray shall be rigid and be completed before cables are laid. Installation of cables trays shall be also include fixing by means of dash fasteners or by exposing of MS rods in the ceiling to support the tray in a rigid and perfect manner. Cutting of RCC/brick work, welding of suspension rods, repairing including supply of suspension rods etc. shall be deemed to have been included in the erection rates.

Bill of Quantities

(all rates and amount in Rs)

NAME OF WORK :- CONSTRUCTION OF OFFICER'S QUARTERS AT JAITARAN (RAJ.)					
CIVIL WORK:- SCHEDULE OF QUANTITIES					
NOTE: ALL RATES HAVE BEEN ANALYSED USING THE COST OF CEMENT AS RS.6,300/- PER MT and COST OF REINFORCEMENT STEEL AS RS.47,590/- PER MT					
S.No	Description of Item	Qty.	Unit	Rate	Amount
1	<u>EARTH WORK</u>	-			
1.01	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift up to 1.5 m, including getting out the excavated soil and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering, etc. and disposal of surplus excavated soil as directed, within a lead of 50 m.				
(a)	All kinds of soil. (from 0.00 mts to 1.50 mts.)	170	cum	157.50	26,775.00
(b)	All kinds of soil. (from 1.50 mts to 3.00 mts.)	25	cum	203.75	5,093.75
1.02	Excavating trenches of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, depth up to 1.5 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m :				
(a)	All kinds of soil				
(i)	Pipes, cables etc. not exceeding 80 mm dia.	50	metre	127.55	6,377.50
(ii)	Pipes, cables etc. exceeding 80 mm dia.but not exceeding 300 mm	70	metre	208.30	14,581.00
1.03	Supplying and filling in plinth with Local sand under floors, including watering, ramming, consolidating and dressing complete.	50	cum	910.25	45,512.50
1.04	Dry stone pitching 22.5 cm thick including Supply of stones and preparing surface complete.	490	sqm	422.80	2,07,172.00
	TRADE TOTAL				3,05,511.75

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
2	<u>CEMENT CONCRETE (PCC)</u>	-			
2.01	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level :				
(a)	1:4:8 (1 Cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size)	10	cum	4301.15	43,011.50
(b)	1:5:10 (1 Cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size)	18	cum	4004.00	72,072.00
2.02	Providing and laying cement concrete in retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets, sunken floor, etc., up to floor five level , excluding the cost of centering, shuttering and finishing:				
(a)	1:2:4 (1 Cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	7	cum	6450.00	45,150.00
(b)	1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size)	25	cum	5818.00	1,45,450.00
2.03	Providing and laying damp-proof course 40 mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 12.5 mm nominal size).	16	sqm	257.80	4,124.80
2.04	Applying a coat of residual petroleum bitumen of grade of VG-10 of approved quality using 1.7 kg per square metre on damp proof course after cleaning the surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil.	16	sqm	132.00	2,112.00
2.05	Extra for providing and mixing water proofing material in cement concrete work in doses by weight of cement as per manufacturer's specification.	4	Kg	48.15	192.60
	TRADE TOTAL				286,857.60

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
3	<u>RCC WORK</u>	-			
3.01	Centering and shuttering including strutting, propping etc. and removal of form for :				
(a)	Foundations, footings, bases of columns, etc. for mass concrete	110	sqm	196.45	21,609.50
(b)	Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc.	25	sqm	360.80	9,020.00
(c)	Suspended floors, roofs, landings, balconies and access platform.	400	sqm	401.65	1,60,660.00
(d)	Shelves (Cast in situ)	35	sqm	401.65	14,057.75
(e)	Lintels, beams, plinth beams, girders, bressumers and cantilevers	455	sqm	332.15	1,51,128.25
(f)	Columns, Pillars, Piers, Abutments, Posts and Struts	210	sqm	453.35	95,203.50
(g)	Stairs, (excluding landings) except spiral-staircases	30	sqm	395.65	11,869.50
3.02	Providing and laying in position reinforced cement concrete work of grade 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size) for all works, excluding the cost of centering, shuttering, finishing and reinforcement				
(a)	All works up to plinth level	63	cum	6230.20	3,92,502.60
(b)	All works above plinth level up to floor V level	93	cum	7074.30	6,57,909.90
	TRADE TOTAL				1534518.25
4	<u>BRICK WORK</u>	-			
4.01	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in Cement mortar 1:6 (1 cement : 6 coarse sand) in all shapes and sizes				
(a)	All work in foundations and up to plinth level	50	cum	4677.25	2,33,862.50
(b)	All works in superstructure above plinth level up to floor V level	100	cum	5426.15	5,42,615.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
4.02	Half brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in Cement mortar 1:4 (1 cement : 4 coarse sand)				
(a)	All work in foundations and up to plinth level	10	sqm	584.75	5,847.50
(b)	All works in superstructure above plinth level up to floor V level	300	sqm	665.80	1,99,740.00
4.03	Extra for providing and placing in position 2 Nos. 6mm dia. M.S. bars at every third course of half brick masonry .	300	sqm	69.50	20,850.00
	TRADE TOTAL				10,02,915.00
5	<u>STEEL WORKS ; STEEL REINFORCEMENT</u>				
5.01	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete for all levels.				
(a)	Thermo-Mechanically Treated bars	15	MT	68,100.00	10,21,500.00
5.02	<u>STEEL WORKS</u> Providing and fixing 1mm thick M.S. sheet door with frame of 40x40x6 mm angle iron and 3 mm M.S. gusset plates at the junctions and corners, all necessary fittings complete, including applying a priming coat of approved steel primer. Using M.S. angles 40x40x6 mm for diagonal braces	5	sqm	3073.85	15,369.25
5.03	Providing and fixing circular/ Hexagonal cast iron or M.S. sheet box for ceiling fan clamp , of internal dia 140 mm, 73 mm height, top lid of 1.5 mm thick M.S. sheet with its top surface hacked for proper bonding, top lid shall be screwed into the cast iron/ M.S. sheet box by means of 3.3 mm dia round headed screws, one lock at the corners. Clamp shall be made of 12 mm dia M.S. bar bent to shape as per standard drawing.	17	each	142.95	2,430.15
5.04	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required.				
(a)	In gratings, frames, guard bar, ladder, railings, brackets, gates, grills and similar works	1615	kg	90.10	1,45,511.50

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
5.05a	Providing and fixing nickel plated M.S. pipe curtain rods with nickel plated brackets :	18	R.M.	126.60	2,278.80
5.05 b	Providing and fixing hand rail of M.S. tube approved size by welding etc. to steel ladder railing, balcony railing, staircase railing and similar works, including applying priming coat of approved steel primer.	115	Kg	104.70	12,040.50
5.06	Providing and fixing in position collapsible steel shutters with vertical channels 20x10x2 mm and braced with flat iron diagonals 20x5 mm size, with top and bottom rail of T-iron 40x40x6 mm, with 40 mm dia steel pulleys, complete with bolts, nuts, locking arrangement, stoppers, handles, including applying a priming coat of approved steel primer.	15	sqm	5291.30	79,369.50
	TRADE TOTAL				12,78,499.70
6	FLOORING WORK				
	<u>MARBLE AND GRANITE WORK</u>				
6.01	Mirror polishing on marble work/Granite work/stone work where ever required to give high gloss finish complete.	240	sqm	212.85	51,084.00
6.02	Providing edge moulding to 18 mm thick stone counters, Vanities, Staircase Treads etc., including machine polishing to edge to give high gloss finish etc. complete as per design approved by Engineer-in-Charge.				
(a)	Granite work	16	metre	230.55	3,688.80
(b)	Marble work	15	metre	136.10	2,041.50
6.03(a)	Providing and fixing Marble work gang saw cut (polished and machine cut) Raj Nagar Plain white marble/ Udaipur green marble/ Zebra black marble, of thickness 18 mm for kitchen plate form, vanity counter, window sills, facia and similar locations of required size approved shade, colour & texture laid over average 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), including joints treated with white cement mortar 1:2 (1 white cement : 2 marble dust) with an admixture of pigment to match the marble shade for area of slab up to 0.50 sqm	12	sqm	2341.50	28,098.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
6.03(b)	Providing and fixing 18 mm thick gang saw cut, mirror polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills ,facias and similar locations of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment,epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels. Area of slab over 0.50 sqm . Granite of any colour and shade in toilet and kitchen platform	12	sqm	3907.40	46,888.80
6.04	Extra for providing opening of required size & shape for wash basin/ kitchen sink in kitchen platform, vanity counter and similar location in marble/Granite/stone work, including necessary holes for pillar taps etc. including moulding, rubbing and polishing of cut edges etc. complete.	6	Each	386.60	2,319.60
6.05	Extra for fixing marble /granite stone, over and above corresponding basic item, in facia and drops of width upto 150 mm with epoxy resin based adhesive, including cleaning etc. complete.	15	sqm	247.40	3,711.00
6.06	Providing and fixing Marble work gang saw cut (polished and machine cut) Raj Nagar Plain white marble/ Udaipur green marble/ Zebra black marble, of thickness 18 mm for Dado, Risers, skirtings , Pillars, wall lining (veneer work), backing filled with a grout of average 12 mm thick in cement mortar 1:3 (1 cement : 3 coarse sand), including pointing with white cement mortar 1:2 (1 white cement : 2 marble dust) with an admixture of pigment to match the marble shade (a) Area of slab upto 0.50 sqm	20	sqm	2782.65	55,653.00
	<u>SUB HEAD-XI :FLOORING WORKS</u>				
6.07	Providing & fixing Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including rubbing and polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand)	-			

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(a)	25 mm thick	60	sqm	1141.40	68,484.00
6.08	Providing & fixing Kota stone slabs 20 mm thick in risers of steps, skirting, dado and pillars laid on 12 mm (average) thick cement mortar 1:3 (1 cement: 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and polishing complete.	16	sqm	1191.25	19,060.00
6.09	Extra for pre finished nosing to treads of steps of kota stone.	48	metre	75.80	3,638.40
6.10	Extra for kota stone flooring in treads of steps and risers using single length up to 2.00 metre .	10	sqm	16.90	169.00
6.11	Providing & fixing Marble stone flooring with 18 mm thick marble stone, as per sample of marble approved by Engineer-in-charge, over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with grey cement slurry, including rubbing and polishing complete with				
(a)	Rajnagar Plain	240	sqm	1757.60	4,21,824.00
(b)	Udaipur Green marble	27	sqm	1757.60	47,455.20
6.12	Providing and Laying Premium quality ceramic glazed wall tiles of size 12"x18" conforming to IS: 15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades except burgundy, bottle green, black as approved by Engineer-in-Charge, in skirting, risers of steps and dados , over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.	100	sqm	836.65	83,665.00
6.13	Providing and laying rectified Glazed Ceramic floor tiles of size 300x300 mm or more (thickness to be specified by the manufacturer), of 1st quality conforming to IS : 15622, of approved make, in all colours, shades, except White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick Cement Mortar 1:4 (1 Cement : 4 Coarse sand), including pointing the joints with white cement and matching pigments etc., complete.	24	sqm	1009.60	24,230.40

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
7	FINISHING				
7.01	Providing & applying 12 mm cement plaster of mix : Internal work on walls				
(a)	1:4 (1 cement: 4 coarse sand)	810	sqm	172.30	1,39,563.00
7.02	Providing & applying 6 mm cement plaster of mix : Internal work on Ceiling/ RCC Work				
(a)	1:3 (1 cement : 3 fine sand)	400	sqm	134.70	53,880.00
7.03	Providing & applying 18 mm thk. External cement plaster in two coats under layer 12 mm thick cement plaster 1:5 (1 cement: 5 coarse sand) and a top layer 6 mm thick cement plaster 1:3 (1 cement : 3 coarse sand) finished rough with sponge.	700	sqm	258.90	1,81,230.00
7.04	Extra for providing and mixing water proofing material in cement plaster work in proportion recommended by the manufacturers.	180	Kg	50.65	9,117.00
7.05	Distempering with oil bound washable distemper of approved brand and manufacture to give an even shade :				
7.06	New work (two or more coats) over and including water thinnable priming coat with cement primer Finishing walls with textured exterior paint of required shade :	1210	sqm	89.70	1,08,537.00
(a)	New work (Two or more coats applied @ 3.28 ltr/10 sqm) over and including priming coat of exterior primer applied @ 2.20kg/10 sqm	700	sqm	146.45	1,02,515.00
7.07	Finishing walls with water proofing cement exterior paint of required shade :				
(a)	New work (Two or more coats applied @ 3.84kg/10 sqm)	50	sqm	57.85	2,892.50
7.09	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	800	sqm	89.65	71,720.00
7.10	Painting with synthetic enamel paint , having VOC (Volatile Organic Compound) content less than 150 grams/ litre, of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour.				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(a)	Two coats	150	sqm	71.60	10,740.00
7.11	Applying one or more coats of primers				
(a)	With ready mixed pink or Grey primer of approved brand and manufacture on wood work (hard and soft wood)	250	sqm	32.95	8,237.50
(b)	With ready mixed red oxide zinc chromate primer of approved brand and manufacture on steel galvanised iron/ steel works	150	sqm	27.00	4,050.00
7.12	Neat cement punning.	20.00	sqm	41.4	828.00
7.13	Add for plaster drip course/ groove in plastered surface or moulding to R.C.C. projections.	200.00	metre	30.75	6,150.00
	TOTAL				6,99,460.00
8	<u>SUB HEAD-IX :WOOD AND PVC WORK</u>				
8.01	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position with hold fast lugs or with dash fasteners of required dia & length (hold fast lugs or dash fasteners shall be paid for separately)				
(a)	Sal wood	2.5	Cum	75558.60	1,88,896.50
8.02	Providing and fixing ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type , core of block board construction with frame of 1st class hard wood and well matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
a	25 mm thick (for cupboard) including ISI marked nickel plated bright finished M.S. piano hinges with necessary screws	20	sqm	2109.00	42,180.00
8.03	Providing and fixing ISI marked flush door shutters conforming to IS :2202 (Part I) non-decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters:				
a	30 mm thick including ISI marked Stainless Steel butt hinges with necessary screws	50	sqm	1735.35	86,767.50
8.04	Extra for Providing and fixing flush doors with decorative veneering instead of non decorative ISI marked flush door shutters conforming to IS: 2202 (Part 1)				
	On one side only	20	sqm	394.90	7,898.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
8.05	Extra for providing lipping with 2nd class teak wood battens 25 mm minimum depth on all edges of flush door shutters (over all area of door shutter to be measured).	70	sqm	365.85	25,609.50
8.06	P/F Teak wood beading 19x6 mm	155	RM	75.00	11,625.00
8.07	Providing 40x5 mm flat iron hold fast 40 cm long including fixing to frame with 10 mm diameter bolts, nuts and wooden plugs and embedding in cement concrete block 30x10x15cm 1:3:6 mix (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size)	50	each	117.35	5,867.50
8.08	Extra for providing frosted glass panes 4 mm thick instead of ordinary float glass panes 4 mm thick in doors, windows and clerestory window shutters. (Area of opening for glass panes excluding portion inside rebate shall be measured).	10	sqm	5.80	58.00
8.09	Prime cost for hardware fittings	LS			55000.00
8.10	Contractor's percentage 25%	55000.00		25.00%	13750.00
8.11(a)	Providing and fixing second class teak woodwire gauge shutters using galvanized M.S. wire gauge of average width of aperture 1.4 mm in both directions with wire of dia, 0.63 mm, for doors, windows and clerestory windows with hinges and necessary screws :35 mm thick shutters with frame of 100mm style, 100mm top rail, 150mm lock rail and 200mm bottom rail for door shutters with ISI marked MS pressed butt hinges finishes with primer and synthetic enamel painting necessary teak wood beading complete.	18.00	Sqm	3063.05	55134.90
8.11(b)	Providing and fixing second class teak wood wire gauge shutters using galvanized M.S. wire gauge of average width of aperture 1.4 mm in both directions with wire of dia, 0.63 mm, for doors, windows and clerestory windows with hinges and necessary screws ,30 mm thick shutters with frame of 75mm style,top and bottom rail forwindows shutters with ISI marked MS pressed butt hinges finishes with primer and synthetic enamel painting ,necessary teak wood beading complete	36.00	Sqm	2709.25	97533.00
8.12	Providing and fixing second class teak wood glazed shutters for doors, windows and clerestory windows using 4 mm thick float	36.00	SQ MT	2939.75	105831.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
8.13	glass panes, including ISI marked M.S.pressed butt hinges bright finished of required size with necessary screws.30 mm thick shutters with frame of 75mm style,top and bottom rail for windows shutters with ISI marked MS pressed butt hinges finishes with primer and synthetic enamel painting ,necessary teak wood beading complete. Providing and fixing Pre-laminated flat pressed 3 layer (medium density) particle board or graded wood particle board IS : 3087 marked, with one side decorative and other side balancing lamination Grade I, Type II exterior grade IS : 12823 marked, in shelves with screws and fittings wherever required, edges to be painted with polyurethane primer (fittings to be paid separately). 18 mm thick	15.00	sqm	1202.00	18030.00
8.14	Providing and fixing 18 mm thick, 150 mm wide pelmet of flat pressed 3 layer or graded wood particle board medium density grade I, IS : 3087 marked, including top cover of 6 mm commercial ply wood conforming to IS: 303 BWR grade, nickel plated M.S. pipe 20 mm dia (heavy type) curtain rod with nickel plated brackets, including fixing with 25x3 mm M.S. flat 10 cm long fixed to pelmet with hollock wood cleats of size 100 mm x 40 mm x 40 mm on both inner side of pelmet and rawl plugs 75 mm long etc. all complete.	50.00	RM	372.75	18637.50
8.15	Extra for using veneered particle board conforming to IS 3097 Grade I, in item of pelmet 18mm thick 150mm wide. Particle board with decorative veneering on both sides	50.00	RM	92.9	4645.00
8.16	Providing and fixing teak wood lipping of size 25x3 mm in pelmet.	100.00	RM	49	4900.00
8.17	Melamine polishing on wood work (one or more coat).	25.00	sqm	76.7	1917.50
8.18	Providing and fixing flat pressed 3 layer particle board medium density exterior grade (Grade I) or graded wood particle board IS : 3087 marked, to frame, backing or studding with screws etc. complete (Frames, backing or studding to be paid separately) : 12 mm thick	25.00	sqm	528.6	13215.00
8.19	Providing & Fixing decorative high pressure laminated sheet of plain /wood grain in gloss/	50.00	sqm	676.4	33820.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
	matt / suede finish with high density protective surface layer and reverse side of adhesive bonding quality conforming to IS :2046 Type S, including cost of adhesive of approved quality.1.0 mm thick				
	TRADE TOTAL				7,91,315.90
9	ROAD WORK				
9.01	Filling with earth brought from outside in plot, plinth, foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering etc.	165	cum	320.90	52948.50
9.02	Preparation and consolidation of sub grade with power road roller of 8 to 12 tonne capacity after excavating earth to an average of 22.5 cm depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade and disposal of surplus earth with lead upto 50 metres.	1100	Sqm	81.29	89,419.00
9.03	Providing and laying C.C. pavement of mix 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate) be laid to required slope and camber in pannels as required including consolidation finished with screed board vibrator, vacuum dewatering process and finally finished by floating, brooming with wire brush etc. complete as per specifications and direction of Engineer-in-charge.(The panel shuttering work shall be paid for separately).	20	cum	5450.45	1,09,009.00
9.04	Providing and laying factory made chamfered edge Cement Concrete paver blocks of (M-30) required strength, thickness & size/shape, made by table vibratory method using PU mould, laid in required colour & pattern over 50mm thick compacted bed of fine sand, compacting and proper embedding/laying of inter locking paver blocks into the sand bedding layer through vibratory compaction by using plate vibrator, filling the joints with jamuna sand and cutting of paver blocks as per required size and pattern, finishing and sweeping extra sand in footpath, parks, lawns, drive ways or light traffic parking etc. complete as per manufacturer's specifications & direction of Engineer-in-Charge. 60mm thick C.C. paver block of M-30 grade with approved design & pattern	172	Sqm	602.2	1,03,578.40

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
9.05	Providing and laying at or near ground level factory made kerb stone of M-25 grade cement concrete in position to the required line, level and curvature, jointed with cement mortar 1:3 (1 cement : 3 coarse sand), including making joints with or without grooves (thickness of joints except at sharp curve shall not to more than 5mm), including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge (length of finished kerb edging shall be measured for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-Charge)	5	cum	5295.90	26,479.50
	TOTAL				3,81,434.40
10	WATERPROOFING WORK				
10.01	Providing and laying water proofing treatment in sunken portion of WCs , bathroom etc., by applying cement slurry mixed with water proofing cement compound consisting of applying : a) First layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @ 0.253 kg/sqm. This layer will be allowed to air cure for 4 hours. b) Second layer of slurry of cement @ 0.242 kg/sqm mixed with water proofing cement compound @ 0.126 kg/sqm. This layer will be allowed to air cure for 4 hours followed with water curing for 48 hours. The rate includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes and masonry with polymer mixed slurry.	55	sqm	283.10	15,570.50
10.02	Providing and laying cement concrete in sunken floor etc., up to floor five level , excluding the cost of centering, shuttering and finishing:1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size)	10	cum	5656.20	56,562.00
10.03	Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs , balconies, terraces etc consisting of following operations: a) Applying a slurry coat of neat cement using 2.75 kg/sqm of cement admixed with water proofing compound conforming to IS. 2645 and approved by Engineer-in-charge over the RCC slab including adjoining walls upto 300	240	sqm	1019.05	2,44,572.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
	mm height including cleaning the surface before treatment. b) Laying brick bats with mortar using broken bricks/brick bats 25 mm to 115 mm size with 50% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge over 20 mm thick layer of cement mortar of mix 1:5 (1 cement :5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of junctions of walls and slabs.				
	c) After two days of proper curing applying a second coat of cement slurry using 2.75 kg/ sqm of cement admixed jointless cement mortar of mix 1:4 (1 cement :4 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge including laying glass fibre cloth of approved quality in top layer of plaster and finally finishing the surface with trowel with neat cement slurry and making pattern of 300x300 mm square 3 mm deep. e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Engineer-in-Charge with average thickness of 120 mm and minimum thickness at khurra as 65 mm.				
	TOTAL				3,16,704.50
11 11.01	SANITARY INSTALLATION Providing and fixing water closet squatting pan (Indian type W.C. pan) with 100mm sand cast iron P or S trap, 10 litre low level white P.V.C. flushing cistern , including flush pipe, with manually controlled device (handle lever) conforming to IS : 7231, with all fittings and fixtures complete, including cutting and making good the walls and floors wherever required :				
	White Vitreous china Orissa pattern W.C. pan of size 580x440mm with integral type foot rests.	3	each	3,392.80	10,178.40

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
11.02	Providing and fixing white vitreous china pedestal type water closet (European type W.C. pan) with seat and lid, 10 litre low level white P.V.C. flushing cistern, including flush pipe, with manually controlled device (handle lever), conforming to IS : 7231, with all fittings and fixtures complete, including cutting and making good the walls and floors wherever required:				
(a)	W.C. pan with ISI marked white solid plastic seat cover and lid.	3	each	3,317.30	9,951.90
11.03	Providing and fixing wash basin with C.I. brackets, 15 mm C.P. brass pillar taps, 32 mm C.P. brass waste of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever require:				
(a)					
	White Vitreous China Flat back wash basin size 550x 400 mm with single 15 mm C.P. brass pillar tap	9	each	1807.10	16,263.90
11.03	Providing and fixing stainless steel kitchen sink A ISI 304(18/8) as per IS 13983 with C.I. brackets and SS plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required : Kitchen sink with drain board and size 510x1040mm bowl depth 250mm	3	each	7052.15	21,156.45
(b)					
11.04	Providing and fixing P.V.C. waste pipe for sink or wash basin including P.V.C. waste fittings complete.				
	Flexible pipe				
(a)	32 mm dia	9	each	74.45	670.05
(b)	40 mm dia	3	each	79.75	239.25
11.05	Providing and fixing 600x450 mm beveled edge mirror of superior glass (of approved quality) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete.	9	each	793.95	7,145.55
(a)					
(b)	shelf with edges round off, supported on anodised aluminium angle frame with C.P. brass brackets and guard rail complete fixed with 40 mm long screws, rawl plugs etc., complete.	9	each	543.80	4,894.20
11.06	Providing and fixing CP brass bib cock short body as per approved quality conforming to IS 8931.: 15 mm nominal bore	12	each	459.50	5,514.00
(a)					

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(b)	CP brass long body	12	each	610.65	7,327.80
(c)	CP brass stop cock	18	each	619.75	11,155.50
(d)	CP Shower rose with 15 mm inlet	6	each	86.35	518.10
(e)	C.P brass toilet Paper holder	3	each	415.90	1,247.70
11.07	Providing and fixing CP brass angle valve for basin mixer and geyser points of approved quality conforming to IS: 8931 : 15mm nominal bore	30	each	507.70	15,231.00
11.08	Providing and fixing unplasticised PVC connection pipe with brass unions : 45 cm length 15 mm nominal bore	36	each	68.60	2,469.60
11.09	Providing and fixing soil, waste and vent pipes :				
(a)	100 mm dia. Centrifugally cast (spun) iron socketed & spigot (S&S) pipe as per IS: 3989.	25	metre	917.75	22,943.75
(b)	75 mm dia. Centrifugally cast (spun) iron socketed & spigot (S&S) pipe as per IS: 3989.	60	metre	791.30	47,478.00
11.10	Providing and fixing M.S. holder-bat clamps of approved design to Sand Cast iron/cast iron (spun) pipe embedded in and including cement concrete blocks 10x10x10cm of 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) including cost of cutting holes and making good the walls etc. :				
(a)	For 100 mm dia. Pipe	15	each	152.90	2,293.50
(b)	For 75 mm dia. Pipe	30	each	150.60	4,518.00
11.11	Providing and fixing bend of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.				
(a)	100 mm Sand cast iron S&S as per IS - 3989	6	each	385.70	2,314.20
(b)	75 mm Sand cast iron S&S as per IS – 3989	8	each	318.50	2,548.00
11.12	Providing and fixing heel rest sanitary bend				
(a)	100 mm Sand cast iron S&S as per IS – 3989	2	each	371.75	743.50
11.13	Providing and fixing single equal plain junction of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.				
(a)	100x100x100mm Sand cast iron S&S as per IS - 3989	6	each	623.80	3,742.80
(b)	75x75x75mm Sand cast iron S&S as per IS - 3989	8	each	472.95	3,783.60
11.14	Providing and fixing terminal guard:				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(a)	100 mm Sand cast iron S&S as per IS 3989	2	each	434.50	869.00
(b)	75 mm Sand cast iron S&S as per IS 3989	2	each	370.75	741.50
11.15	Providing and fixing collar :				
(a)	100 mm Sand cast iron S&S as per IS 3989	8	each	318.35	2,546.80
(b)	75 mm Sand cast iron S&S as per IS 3989	8	each	219.75	1,758.00
11.16	Providing lead caulked joints to sand cast iron/centrifugally cast (spun) iron pipes and fittings of diameter:				
(a)	100 mm	15	each	243.75	3,656.25
(b)	75 mm	32	each	205.30	6,569.60
11.17	Providing and fixing M.S. stays and clamps for sand cast iron/centrifugally cast (spun) iron pipes of diameter :				
(a)	100 mm	14	each	68.60	960.40
(b)	75 mm	14	each	57.15	800.10
11.18	Providing and fixing trap of self cleansing design with screwed down or hinged grating with or without vent arm complete, including cost of cutting and making good the walls and floors :				
(a)	100 mm inlet and 100 mm outlet Sand cast iron S&S as per IS: 3989.	3	each	982.55	2,947.65
(b)	100 mm inlet and 75 mm outlet Sand cast iron S&S as per IS: 3989.	27	each	1,020.90	27,564.30
11.19	Providing and fixing on wall face unplasticised rigid PVC rain water pipes conforming to IS: 13592 Type A, including jointing with seal ring confirming to IS : 5382, leaving 10mm gap for thermal expansion.				
a)	Single socked pipe 75 mm diameter	10	metre	145.70	1,457.00
b)	Single socked pipe 110 mm diameter	50	metre	231.65	11,582.50
11.20	Providing and fixing on wall face unplasticised - PVC moulded fittings / accessories for unplasticised rigid PVC rain water pipe confirmint to IS: 13592 Type A, including jointing with seal ring confirming to IS : 5382, leaving 10mm gap for thermal expansion.				
(A) (i)	75 mm Coupler	2	each	108.65	217.30
(A) (ii)	110 mm Coupler	7	each	138.30	968.10
(B) (i)	75 mm Bend 87.5	2	each	113.25	226.50

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(B) (ii)	110 mm Bend 87.5	7	each	161.55	1,130.85
(C) (i)	75 mm Shoe (Plain)	2	each	167.85	335.70
(C) (ii) 11.21	110 mm Shoe (Plain) Providing and fixing unplasticised-PVC clips of aproved design to unplasticised - PVC rain water pipes by means of 50x50x50mm hard wood plug, screwed with MS Screws of required length, including cutting brick work and fixing in cement mortor 1:4 (1 cement : 4 coarse sand) and making good the walls etc. complete.	7	each	295.10	2,065.70
a)	75 mm	8	each	189.05	1,512.40
b)	110 mm	30	each	189.05	5,671.50
11.22	Providing and fixing of the inlet of rain water pipe cast iron grating of 15 cm diameter & weighing not less than 440 gms	8	each	41.10	328.80
	TRADE TOTAL				283112.20
12.01	<u>WATER SUPPLY</u> Providing and fixing chlorinated polyvinyl Chloride (CPVC) pipes, having thermal stability for hot and cold water supply, including all CPVC plain & brass threaded fittings, fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and cost of cutting chases and making good the same including testing of joints. complete as per direction of Engineer in charge.				
(a)	Concealed Internal work , including cutting chases and making good the walls etc				
(i)	15 mm nominal outer dia pipes	30	metre	270.00	8,100.00
(ii)	20 mm nominal outer dia pipes	45	metre	296.40	13,338.00
(iii)	25 mm nominal outer dia pipes	5	metre	351.30	1,756.50
12.02	Providing and fixing G.I. pipes complete with G.I. fittings and clamps, including cutting and making good the walls etc.				
(a)	Internal work – Exposed on wall				
(i)	15 mm dia. nominal bore	35	metre	215.10	7,528.50
(ii)	20 mm dia. nominal bore	40	metre	249.30	9,972.00
(iii)	25 mm dia. nominal bore	25	metre	304.15	7,603.75
(iv)	32 mm dia. nominal bore	25	metre	343.20	8,580.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(v) 12.03	40 mm dia. nominal bore Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc.	10	metre	425.65	4,256.50
(a)	External work				
(i)	15 mm dia. nominal bore	15	metre	186.25	2,793.75
(ii)	20 mm dia. nominal bore	5	metre	209.95	1,049.75
(iii)	25 mm dia. nominal bore	20	metre	257.30	5,146.00
(iv)	32 mm dia. nominal bore	65	metre	281.05	18,268.25
12.04	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) :				
(i)	25 mm nominal bore.	6	each	428.85	2,573.10
(ii)	32 mm nominal bore.	6	each	501.50	3,009.00
12.05	Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete :				
	25 mm nominal bore	3	each	449.95	1,349.85
12.06	Providing and fixing gun metal non- return valve of approved quality (screwed end) :				
(i)	32 mm nominal bore Horizontal	2	each	553.30	1,106.60
(ii)	33 mm nominal bore Vertical	1	each	634.60	634.60
12.07 (A)	Providing and fixing brass ferrule with C.I. mouth cover including boring and taping the main				
(i)	15 mm nominal bore	1	each	245.95	245.95
12.07 (B)	Providing and fixing water meter with C.I. stop cock in G.I. pipe line including cuttinf and treading the pipe and making goo long screw etc. complete (cost of water meter and stop cock to be paid seperately)				
(i)	15 mm nominal bore	3	each	315.50	946.50
12.08	Constructing masonry Chamber 30x30x50 cm inside , in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for stop cock , with C.I. surface box 100x100x75 mm (inside) with hinged cover fixed in cement concrete slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), i/c necessary excavation , foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand)				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
	12mm thick, finished with a floating coat of neat cement complete as per standard design:				
(a)	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	1	each	1,157.75	1,157.75
12.09	Constructing masonry Chamber 60x45x50 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for water meter complete with C.I. double flap surface box 400x200x200 mm (inside) with locking arrangement and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) , i/c necessary excavation , foundation concrete 1:5:10 (1 cement : 5 fine sand:10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design : With common burnt clay F.P.S.(non modular) bricks of class designation 7.5	1	each	6,039.95	6,039.95
12.10	Painting G.I. pipes and fittings with synthetic enamel white paint with two coat over a ready mixed priming coat, both of approved quality for new work :				
(a)	15 mm diameter pipe.	35	metre	9.60	336.00
(b)	20 mm diameter pipe.	40	metre	11.35	454.00
(c)	25mm diameter pipe.	25	metre	14.95	373.75
(d)	32 mm diameter pipe.	25	metre	17.70	442.50
(e)	40 mm diameter pipe.	10	metre	21.00	210.00
12.11	Painting C.I. pipes and fittings with two coats of anticorrosive bitumastic paint of approved quality :				
(a)	75 mm diameter pipe.	40	metre	24.75	990.00
(b)	100 mm diameter pipe.	40	metre	38.65	1,546.00
(c)	150 mm diameter pipe.	60	metre	57.60	3,456.00
12.12	Providing and placing on terrace (at all floor levels) polyethylene water storage tank , ISI: 12701 marked, with cover and suitable locking locking arrangement and making necessary holes for inlet, outlet and overflow pipe but without fittings and the base support for tank.				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(a)	For OQ - 3X1000	3000	Litre	7.25	21,750.00
12.13	Cutting holes up to 30x30 cm in walls including making good the same: With common burnt clay F.P.S. (non modular) bricks	3	each	207.95	623.85
12.14	Cutting holes up to 15x15 cm in R.C.C. floors and roofs for passing drain pipe etc. and repairing the hole after insertion of drain pipe etc. with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), including finishing complete so as to make it leak proof.	15	each	193.00	2,895.00
12.15	Making chases up to 7.5x7.5 cm in walls including making good and finishing with matching surface after housing G.I. pipe etc.	50	metre	85.70	4,285.00
12.16	Providing and fixing G.I. Union in G.I. pipe including cutting and threading the pipe and making long screws etc. complete (New work):				0.00
(a)	15 mm nominal bore	10	each	165.25	1,652.50
(b)	20 mm nominal bore	3	each	188.50	565.50
(c)	25 mm nominal bore	5	each	200.10	1,000.50
(d)	32 mm nominal bore	6	each	240.75	1,444.50
	TRADE TOTAL				147481.40
	<u>DRAINAGE</u>				
13.01	Providing, laying and jointing glazed stoneware pipes class SP-1 with stiff mixture of cement mortar in the proportion of 1:1 (1 cement : 1 fine sand) including testing of joints etc. complete :				
(a)	100 mm diameter	20	metre	206.55	4,131.00
(b)	150 mm diameter (for drainage and rainwater harvesting)	35	metre	314.35	11,002.25
(c)	200 mm diameter (for drainage and rainwater harvesting)	20	metre	462.15	9,243.00
13.02	Providing and laying cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) all-round S.W. pipes including bed concrete as per standard design:				
(a)	100 mm diameter S.W. pipe	20	metre	592.60	11,852.00
(b)	150 mm diameter S.W. pipe	35	metre	724.70	25,364.50
(c)	200 mm diameter (for drainage and rainwater harvesting)	20	metre	844.85	16,897.00

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
13.03	Providing and fixing square-mouth S.W. gully trap class SP-1 Complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design :				
(a)	150 x 100 mm size P type. : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	6	each	1,594.35	9,566.10
13.04	Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete :				
(a)	100mm dia. R.C.C. pipe	10	metre	318.50	3,185.00
(b)	150mm dia. R.C.C. pipe	20	metre	348.30	6,966.00
13.05	Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) with R.C.C. top slab with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand : 8 graded stone aggregate 40mm nominal size) inside plastering 12mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) finished with a floating coat of neat cement complete as per standard design :				
(a)	Inside size 90x80 cm and 45 cm deep including C.I. cover with frame (light duty) 455x610 mm internal dimensions total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	8	each	8,507.00	68,056.00
(b)	Inside size 120x90 cm and 90 cm deep including C.I. cover with frame (medium duty) 500mm internal diameter , total weight of cover and frame to be not less than 116 kg (weight of cover 58 kg and weight of frame 58 kg) : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	1	each	18,304.45	18,304.45
13.06	Extra for depth for manholes				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(a)	Size 90x80 cm With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	1	metre	5,638.20	5,638.20
(b)	Size 120x90 cm With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	1	metre	6,753.65	6,753.65
13.07	Providing M.S. foot rests including fixing in manholes with 20x20x10 cm cement concrete blocks 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) as per standard design :				
	With 20 mm diameter round bar	10	each	242.05	2,420.50
13.08	Making connection of drain or sewer line with existing manhole including breaking into and making good the walls, floors with cement concrete 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) cement plastered on both sides with cement mortar 1:3 (1 cement : 3 coarse sand), finished with a floating coat of neat cement				
13.09	For pipes 100 to 250 mm diameter Dismantling of manhole including R.C.C. top slab, C.I. cover with frame, including stacking of useful materials near the site and disposal of unserviceable materials into municipal dumps within 50 m lead :	2	each	364.6	729.20
	Rectangular manhole 90x80 cm and 45 cm deep	1	each	937.25	937.25
13.10	Providing and fixing S.W. intercepting trap in manholes with stiff mixture of cement mortar 1:1 (1 cement : 1 fine sand) including testing of joints etc. complete : 150 mm dia	1	each	392.85	392.85
13.11	Constructing brick masonry road gully chamber 50x45x60 cm with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) including 500x450 mm pre-cast R.C.C. horizontal grating with frame complete as per standard design : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	2	each	3,957.50	7,915.00
	(For Rainwater harvesting)				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
13.12	Constructing brick masonry road gully chamber 110x50x77.5 cm with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) including 500x450 mm pre-cast R.C.C. horizontal grating with frame and vertical grating complete as per standard design : with common burnt clay F.P.S.(non modular) bricks of class designation 7.5	2	each	7,501.45	15,002.90
13.13	Constructing brick masonry chamber for RW harvesting pipe/underground elctrical cable chamber and bends with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg), R.C.C. top slab with 1:2:4 mix (1 cement: 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design:				
(a)	Inside dimensions 455x610 mm and 45 cm deep for single pipe line : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	10	each	4,692.05	46,920.50
(b)	Inside dimensions 500x700 mm and 45 cm deep for pipe line with one or two inlets with common burnt clay F.P.S. (non modular) bricks of class designation 7.5	10	each	5,375.20	53,752.00
	TRADE TOTAL				325029.35
14.01	<u>RAIN WATER HARVESTING</u> Providing and laying in position cement concrete 1:5:10 (1 Cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) excluding the cost of centering and shuttering - All work up to plinth level :	2	cum	4004.00	8,008.00
14.02	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in Cement mortar 1:6 (1 cement : 6 coarse sand) in all shapes and sizes				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
(a)	All work in foudations and up to plinth level	8	cum	4677.25	37,418.00
14.03	Providing & applying 12 mm cement plaster of mix : Internal work on walls				
(a)	1:6 (1 cement: 6 coarse sand)	30	sqm	158.40	4,752.00
14.04	Providing & applying 6 mm cement plaster of mix : Internal work on Ceiling/ RCC Work				
(a)	1:3 (1 cement : 3 fine sand)	10	sqm	134.70	1,347.00
14.05	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete for all levels.				
(a)	Thermo-Mechanically Treated bars	0.5	MT	68,100.00	34,050.00
14.06	Providing and laying in position reinforced cement concrete work of grade 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size) for all works, excluding the cost of centering, shuttering, finishing and reinforcement				
(a)	All works up to plinth level	2	cum	6230.20	12,460.40
14.07	CI Main Hole cover 610x455	2	cum	1872.00	3,744.00
14.08	Centering and shuttering including strutting, propping etc. and removal of form for :				
(a)	Suspended floors, roofs, landings, balconies and access platform.	20	sqm	401.65	8,033.00
14.09	Boring/drilling bore well of required dia for casing/ strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer -in-charge, upto 90 metre depth below ground level.				
(a)	All type of soil : 300 mm dia	20	RM	407.10	8,142.00
14.1	Supplying, assembling, lowering and fixing in vertical position in bore well, Supplying, assembling, lowering and fixing in vertical position in bore well, ERW (Electric Resistance Welded) FE 410 plain slotted having slot of size 1.6/3.20 mm mild steel threaded and socketed/ plain ended casing pipes of required dia, conforming to IS: 8110 of reputed and approved make, having wall thickness not less than 5.40 mm, including painted with outside surface with two coats				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
	of anticorrosive bitumestic paint of approved brand and manufacture, including hire & labour charges, fittings & accessories, all complete, for all depths, as per direction of Engineer-in-charge				
(a)	200 mm nominal size dia	20	mt	1,722.45	34,449.00
14.11	Supplying, filling, spreading & leveling stone boulders of size range 5 cm to 20 cm , in recharge pit, in the required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.	8	cum	504.15	4,033.20
14.12	Supplying, filling, spreading & leveling gravels of size range 5 mm to 10 mm , in the recharge pit, over the existing layer of boulders, in required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.	8	cum	910.65	7,285.20
14.13	Supplying, filling, spreading & leveling coarse sand of size range 1.5 mm to 2 mm in recharge pit, in required thickness over gravel layer, for all leads & lifts, all complete as per direction of Engineer -in-charge.	8	cum	852.60	6,820.80
14.14	Development of tube well in accordance with IS : 2800 (part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method, measuring static level & draw down etc. by step draw down method, collecting water samples & getting tested in approved laboratory, i/c disinfection of tubewell, all complete, including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in-charge.	8.00	hours	677.1	5,416.80
14.15	Providing and fixing suitable size threaded mild steel cap or spot welded plate to the top of bore well housing/ casing pipe, removable as per requirement, all complete for borewell of: 200 mm dia	1	each	243.90	243.90
14.16	Providing and fixing M.S. clamp of required dia to the top of casing/housing pipe of tubewell as per IS: 2800 (part I), including necessary bolts & nuts f required size				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
	complete.				
	200 mm clamp	1	each	1,329.35	1,329.35
14.17	Providing and fixing Bail plug/ Bottom plug of required dia to the bottom of pipe assembly of tubewell as per IS:2800 (part I).				
	200 mm dia	1	each	265.85	265.85
	TRADE TOTAL				1,77,798.50
15	SOAKPIT				
15.01	Providing and laying in position cement concrete 1:5:10 (1 Cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) excluding the cost of centering and shuttering - All work up to plinth level :	0.5	cum	4004.00	2,002.00
15.02	Providing and laying in position reinforced cement concrete work of grade 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size) for all works, excluding the cost of centering, shuttering, finishing and reinforcement				
(a)	All works up to plinth level	1	cum	6230.20	6,230.20
(b)	Suspended floors, roofs, landings, balconies and access platform.	5	sqm	401.65	2,008.25
15.03	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete for all levels.				
(a)	Thermo-Mechanically Treated bars	0.25	MT	68,100.00	17,025.00
15.04	Making soak pit 2.5 m diameter 3.0 metre deep with 45 x 45 cm dry brick honey comb shaft with bricks and S.W. drain pipe 100 mm diameter, 1.8 m long complete as per standard design with common burnt clay FPS (non modular) bricks of class designation 7.5 including excavation etc complete	1	each	18,309.50	18,309.50
	TRADE TOTAL				45,574.95

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
16	ANTI TERMITE TREATMENT				
16.01	Injecting chemical and emulsion chloropyrifos emulsifiable concentrate IS 6944- 1974 - 1% (20 EC) to be used as per manufacturer's specifications for pre-constructional antitermite treatment and creating a chemical barrier as per IS - 6313 PART II, 1981 (or latest) in wall trenches, foundations, basement, top surfaces of plinth filling, junction of walls and floors along the external perimeter of the bldg. surrounding of pipes etc. complete. The work shall be executed through approved agency / agencies and with guarantee of 10 years. including as directed below. Using chemical emulsion as per IS Specification for :-				
1	Back filling in immediate contact with masonry foundations.				
2	Junctions of walls and floors.				
3	External perimeter of the bldg.				
4	Bottom and sides of trenches.				
5	Top surface of plinth filling. (Rate shall be quoted for plinth area at Ground floor only. Plinth area shall be measured for payment.)	215	sqm	402.00	86,430.00
	TRADE TOTAL				86,430.00
17	Electrical works				
	INTERNAL WIRING				
17.01	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 volts, on surface/recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
a	4 way (4 + 12), Double door	3	Each	2175	6525
17.02	Supplying and fixing 5 amps to 32 amps rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load offollowing poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a	32 ATripole pole and neutral (incomer)	3	Each	887	2661
b	40 AMP FPELCB	3	Each	2123	6369
c	5/10/16/ 20 AMP SPMCB(outgoing)	27	Each	169	4563

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
17.03	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copperconductor, single core cable in surface/ recessed medium class PVC conduit as required.				
a	For Sub mains 4 X 6 sq. mm + 2 X 6 sq. mm earth wire	100	RM	389	38900
b	For Circuit wiring 2 X 2.5 sq. mm + 1 X 2.5 sq. mm earth wire	100	RM	131	13100
17.04	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm. FRLS PVC insulated copper conductor single core cable etc. as required.	70	Each	585	40950
17.05	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
a	3 pin 5/6 amp socket outlet (on board 5A SS)	19	Each	79	1501
b	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm. FRLS PVC insulated copper conductor single core cable etc. as required. (For 3pin 5/6 A Socket out let away from board)				
c	3 pin 5/6 amp socket outlet (away from Switch board 5A SS)	19	each	518	9842
D	Wiring for light/ power plug with 2X4 sq. mm FRLS PVC insulated copper conductor single core cable in surface/recessed medium class PVC conduit alongwith 1 No 4 sq. mm FRLS PVC insulated copper conductor single core cable for loop earthing as required	250	Each	162	40500
E	6 pin 15/16 amp socket outlet	16	Each	150	2400
F	Supply, Assembling, Erection and Testing ceiling Fans of 1200mm including providing necessary down wiring connector from ceiling rose to Fan motor.	16	Each	1600	25600

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
G	Supplying and fixing stepped type electronic fan regulator on the existing modular plate switch box including connections but excluding modular plate etc. as required.	16	Each	284	4544
H	-- do -- extension of light / fan point.	4	Each	150	600
17.06	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess	16	Each	750	12000
a	20 mm	170	RM	53	9010
b	25 mm	170	RM	65	11050
17.07	AC Point-Wiring - do -- as above but with 2 x 4 Sqmm PVC insulated FRLS copper conductor wire and earth wire of 2.5 sqmm. PVC insulated FRLS copper conductor wire in PVC conduit (Medium) including providing and fixing of 4 module power unit with 25 Amp Starter plug and top to be provided in conceal / on surface of wall as per direction and making connections.	3	Each	889	2667
a	Supplying and fixing call bell/ buzzer suitable for single phase, 230 volts, complete as required.	3	Each	61	183
b	Supply & fixing of Bell push	3	Each	111	333
17.08	Supply & fixing of Telephone socket outlet	6	Each	95	570
17.09	Supply & fixing of TV Socket outlet	3	Each	94	282
17.10	Supplying and drawing co-axial TV cable RG-6 grade, 0.7 mm solid copper conductor PE insulated, shielded with fine tinned copper braid and protected with PVC sheath in the existing surface/ recessed steel/ PVC conduit as required.	75	RM	28	2100
17.11	SITC of 10 pair Junction box for telephone cable of approved make.	1	Each	500	500
17.12	Supplying and drawing following pair 0.5 mm dia FRLS PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/recessed steel/ PVC conduit as required.	50	RM	18	900
17.13	Supplying and fixing 300mm sweep wall Exhaust fan suitable for use 220/230 volts 50 cycle single phase AC supply including providing and fixing with 6mm thick commercial ply board complete with connection. Make:- Bajaj/ Crompton/ GEC	9	Each	1700	15300

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
17.14	Supply, Assembling,Erection and Testing ceiling Fans of 1200mm including providing necessary down wiring connector from ceiling rose to Fan motor.	16	Each	1600	25600
17.15	Providing and fixing 125mmx125mmx75mm fan dowel boxes with necessary M.S.fan hook and covered with bakelite sheet as per site condition.	16	Each	80	1280
17.16	P/F 1X40W box type fluorescent fitting with low loss copper choke, tube rod, condenser , side holder etc. to be fixed on the wooden round blocks complete with connection. Make:- Philips/ Wipro/ Crompton.	22	Each	600	13200
17.17	Electrical service connections Providing and laying 4 core 35 Sqmm PVC insulated aluminium conductor armoured cable 1.1KV grade on wall/ surface or cancealed manner or in trenches including excavation of cable trenches and providing sand cushioning and brick lining alongwith 2Nos. 8 SWG GI earth wire, brick covering and refilling the earth. The rates shall include providing and fixing necessary cable end box etc. as required at site. including connections and termination on either sides.	500	RM	391.00	195500
17.18	--do--as above but with 2 core 2.5 sq.mm copper cable with 1 No. 8 SWG GI earth wire(for Compound lights)	140	RM	130.00	18200
17.19	--do-- as above but 3 core 4 sq.mm PVC insulated copper cable with in 25 mm GI pipe "B"clas with necessary accessories as required at site along with 2nos 8 SWG GI earth wire (for Pump sets)	75	RM	225.00	16875
17.20	Supplying and fixing cable route marker with 10 cm X 10 cm X 5 mm thick G.I. plate with inscription there on, bolted /welded to 35 mm X 35 mm X 6 mm angle iron, 60 cm long and fixing the same in ground as required.	3	Each	288	864
17.21	(METER PANEL)Supplying installation testing and commissioning of Sleek type cubical panel fabricated out of 2mm sheet steel and suitable frame work having independent compartments for SFU/ MCCB's/ MCB's etc. The panel shall be wall/floor mounted it	1	Set	23500	23500

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
	should be degreased, anti rust treated with two coats of red oxide primer and finished with two coats of powder coated paint. The panel shall have ventilator slots covered with wire mesh from inside. The panel door shall be inter locked with switch gears and have neoprime gasket. The design of the panel shall be such as to offer maximum safety and ease for maintenance. The busbars shall be of tinned copper and supported on non inflammable epoxy cast iron insulators.				
(i)	The terminators of cable/wire shall be from top or bottom as per site requirement. Engraved name plates shall be provided for each feeder cubical panel shall consist of following switch gears including copper leads between busbars and switch gears. 1 no. 100 A FP MCCB (25 KA breaking capacity) incomer. Make:- Crompton/ MDS/ L&T/ SIEMENS.				
(ii)	1 set of Copper bus bar (4 nos.) of size 40x5x1000mm on porcelain insulators complete with incoming and outgoing connections, earthing etc.				
iii)	Space provision for housing 4 Nos (3nos for 3 Quarters and 1 no for Street/common light/Pump room DB) Electronic Energy Meter (3 Phase) with glass window				
iv)	5 nos, 32 Amp TPN MCB (To be fitted in the above Panel for out going to the 3 quarters, 1no for streelight DB and 1 no for Pump room.)				
v)	1 no,32 A DP MCB for out going to the street light DB				
vi)	Ammeter, Voltmeter complete with selector switches				
vii)	1 set of pilot lamps with switches and fuses.				
17.22 (A)	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	3	Set	4490	13470
B	Supplying & fixing of 25X5 mm GI earth strip but in 32 mm GI pipe.	25	RM	270	6750
C	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	25	RM	142	3550

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
D	Providing and fixing M.V. danger notice plate of 200 mm X 150 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single red colour on front side as required.	2	Each	141	282
17.23	Compound and Street Light Supply, Instalation, Testing and Commissioning of CFL Post Top luminiare of Philips/Wipro/Crompton make similar to catalogue no.BRTPCI 118 clear lamp suitable for 11 watts CFL lamps including lamp post made out of 50mm. dia class "B" GI pipe with 12mm base plate 150mmX150mm approx.welded to the bottom of pipe.The entire post shall be 4.5 Mtr length.The post is to be installed in a pit of 1.5 Mtr(min) depth duly concreted upto ground level.The work shall include the following: (a) Making concrete pedestal upto 300 mm above ground level from bottom.	8	Each	4500	36000
	(b) providing and fixing Water proof MS box comprising and including DPMCB 6Amp and Heavy duty bakelite connector (or links for phase and neutral separately).				
	(c) Providing wiring from MS box to the luminiare by means of 3X1.5sqmm. PVC insulated copper wire.				
17.24	(d) Painting pole with one coat of red primer and two coats of enamel paint of approved shade.The concreting shall be done in 1:2:4 nominal mix. Supply, Installation, Testing and Commissioning of Post top luminaire (for Gate) of Philips / Wipro / Crompton make similar to catalogue no.BRPTCI- 118 with x18 watts CFL lamps . The work includes providing & fixing following:	2.0	Each	3800	7600
	(a) Suitable length of class "B" GI pipe of appropriate dia. compatible with the fitting, for its mounting, suitably grouted in gate pillar. (b) Water proof MS Box in the pillar comprising and including DPMCB and Bakelite connector (or one link each for Phase and Neutral)				

S. No.	Description of Item	BO Qty	Unit	Rate	Amount
	(c) Wiring from MS box to light fitting by means of 3X1.5sqmm PVC insulated copper wire in MS conduit as required. (one wire each for Phase, Neutral and earth)				
17.25	Supply & Fixing bulk head fittings of Bajaj/Crompton make with 18 W CFL Lamp.	6	Each	470	2820
17.26 A	Supplying, Installation, Testing and Commissioning of 1 HP Monoblock PumpSet Minimum (3 star rated)at site suitable for operation on 3-Phase 400/440 V A.C. 50 Hz supply with suitable head and discharge . The Pump set shall be Installed on suitable size of P.C.C.(1:2:4) foundation with suitable grouting arrangements. Providing and fixing necessary nut and boltsetc. complete as required.	2	Each	30000	60000
B	The Pumpset shall be installed on suitable size of P.C.C. (1:2:4) Foundation with suitable grouting arrangements. Providing and fixing necessary nuts and bolts etc. complete as required.				
C	D.O.L. starters suitable for 2 h.p. 3 phase 400/440 v pump set with suitable relay, contactors, push buttons, no volt release coil, over load relay etc complete as required.(L& T,Crompton, Seimens)	2	Each	1500	3000
	TRADE TOTAL				681441.00

SUMMARY OF COST

S. No.	Description	Amount (Rs)
1	EARTH WORK	305511.75
2	CEMENT CONCRETE (PCC)	312112.90
3	RCC WORK	1534518.25
4	BRICK WORK	1002915.00
5	STEEL REINFORCEMENT & STEEL WORKS	1278499.70
6	MARBLE AND GRANITE WORK and FLOORING	862010.70
7	FINISHING	699460.00
8	WOOD AND PVC WORK	791315.90
9	ROAD WORK	381434.40
10	WATERPROOFING WORK	316704.50
11	SANITARY INSTALLATION	283112.20
12	WATER SUPPLY	147481.40
13	DRAINAGE	325029.35
14	RAIN WATER HARVESTING	177798.50
15	SEPTIC TANK AND SOAKPIT	45574.95
16	ANTI TERMITE TREATMENT	86430.00
17	ELECTRICAL	681441.00
	GROSS TOTAL	9231350.50
	SAY	9231351.00

LIFE INSURANCE CORPORATION OF INDIA**CHIEF ENGINEER'S OFFICE, NORTHERN ZONAL OFFICE, NEW****TENDER FOR BUILDER'S WORK, WATER SUPPLY, SANITARY INSTALLATION,
ELECTRICAL INSTALLATION AND OTHER ANCILLARY WORKS FOR
CONSTRUCTION OF OFFICERS' QUARTERS BUILDING AT JAITARAN (RAJ.)****SUMMARY**

Note: Tenderers are to quote a single percentage BELOW / ABOVE / AT PAR on the Net Total amount only. Trade wise percentage, if quoted, shall not be accepted and such tenders shall be considered non bonafide.

Quote the percentage up to **TWO** Decimal only.

Amount Put to Tender =	Rs. 9231351.00
<u>(Rupees Ninety Two Lakhs Thirty One Thousand Three Hundred Fifty One Only)</u>	
Less prime Cost (TI no8.09)	(-) Rs 55000/-
Net total:	Rs. 9176351.00/- A

I/We Quote my/our percentage rates

Below / At Par / above

.....PERCENTAGE on

Rs. 9176351.00/- A

(+ / -) Rs.....

Total Amount considering percentage rates Rs.....

Below/At Par/ above

Add Prime Cost (+) **Rs 55000/-**

=====

Net amount **Rs.....****Net amount in words: Rs.....**

.....only)

Signature of contractor with seal & date**Chief Engineer**