TENDER FOR: STRUCTURAL REPAIR & REHABILITATION, PAINTING ETC OF INDIAN BANK OFFICERS QUARTERS KARTHIK BUILDING, JAYAPRAKKASH ROAD, LOKHAANDWALA COMPLEX, ANDHERI WEST, MUMBAI - 400102

TECHNICAL BID

Owner: Indian Bank, Zonal Office Mumbai South, 2n Floor, 37 Mumbai Samachar Marg, Fort, Mumbai 400 023. Office: 022-22611145 Email:zo.mumbai.expprem@indianbank.co.in

Consultant:M/s. Advice Consultants

Email: info@adviceconsultants.in /office@adviceconsultants.in

Tender Ref No: Karthik 001 – 2021-22

Date:25-11-2021

Last Date of Submission: 30-12-2021 upto 03.00 PM

इंडियन बैंक Indian Bank
इलाहाबाद ALLAHABAD

INDEX

FORM OF TENDER

To,
Zonal Manager,
Indian Bank Zonal office Mumbai South,
2nd Floor, 37, Mumbai Samachar Marg,
Fort, Mumbai – 400023.

Dear Sir/s,

Sub:"STRUCTURAL REPAIRS, RENOVATION, FLOORING WORKS, WATERPROOFING WORKS, ELECTRICAL WORKS & PAINTING WORKS AT INDIAN BANK OFFICERS QUARTERS AT KARTHIK BUILDING LOKHANDWALA COMPLEX, ANDHERI (W) , MUMBAI-400 102".

Having duly examined the tender documents including the drawings, specifications, designs bill of quantities relating to the works specified in the under written memorandum and having visited / inspected the site of the said works and having acquired all the requisite information relating there to as affecting this tender, I/We hereby offer to execute the works specified therein at the rates specified in the Bill of quantities **(while submitting Price Bid)** and in accordance, in all respects, with the specifications, designs, drawings and instructions in writing referred to in the conditions of tender, the Articles of Agreement, Special Conditions, if any, the Bill of quantities and Conditions of Contract and with such materials are as specified, by and in all other respects in accordance with such conditions in the Bill of quantities and conditions of contract so far as applicable.

If the tender be accepted, I/We hereby agree to abide and fulfill the terms and conditions of the said contract.

Thanking You,

Tenderers Name & Signature

Date and Company Seal:

इंडियन बैंक Indian Bank
इलाहाबाद ALLAHABAD

NOTICE INVITING TENDER

Indian Bank, Zonal office Mumbai South, Premises Department, Mumbai invites sealed tenders under 2 bid system from reputed and resourceful bidders (Two bid System) for executing "Structural Repairs, Flooring works,Waterproofing works, Electrical works and Painting works at Indian Bank Officers quarters, Karthik Building , Lokhandwala Complex, Andheri (W), Mumbai- 400 102.

1.	Name of Work	Structural Repairs, Flooring works,Waterproofing works, Electrical works and Painting works at Indian Bank officers quarters, Kathik Building , Lokhandwala Complex, Andheri(W) , Mumbai- 400 102
2.	Estimated cost of work	Rs. 267 lakh
3.	Period of completion	9 months reckoned from the 15th day of issue of the work order or handing over of site whichever is later.
4.	Validity of Tender	90 days from the date of opening
5.	Earnest Money Deposit (EMD)	**Rs.2,67,000/- (Rupees Two Lakh Sixty Seven Thousand only)**
6.	Initial Security Deposit (ISD)	2% of the Bid Amount (Including EMD amount)
7.	Retention Money (RM)	8% against each RA bill
8.	Total Security Deposit EMD+ISD+RM	10% of the cost. (50% will be released after 15days of payment of the final bill and the balance 50% will be released after the Defect liability Period of One year).
9.	Value of work for Interim Payment	Each bill should be Minimum 25% of work order amount.
10	Tender Documents	The Tender Documents can be downloaded from the Bank's website (www.indianbank.in under Tenders column)
11.	Cost of Tender documents	**free of cost.**
12.	Liquidated Damages	1% for delay per week of the contract value subject to maximum of 10% of contract value.
13.	Pre-bid Meeting	On **16/12/2021 at 11.00 AM** at Indian Bank, Zonal office Mumbai South South Mumbai, Premises dept, 2nd floor, 37,

		Mumbai Samachar Marg, Fort, Mumbai 400 023. All interested bidders can send their queries through email before the prebid date and get their queries clarified during the pre-bid meeting.
14.	Last date of submission of Tenders	**30/12/2021- 15.00hrs**, at Indian Bank, Zonal office Mumbai South, Premises department, 2nd floor, 37, Mumbai Samachar Marg, Fort, Mumbai 400 023.
15.	Date of Opening of Technical bid	**30/12/2021- 15.30hrs**, at Indian Bank, Zonal office Mumbai South, Premises department, 2nd floor, 37, Mumbai Samachar Marg, Fort, Mumbai 400 023.
16.	Date of Opening of Financial bid (Manually)	Will be intimated later to the qualified Tenderers only.
17.	Defect Liability Period	12 Months from the date of Virtual Completion of work.

Note:

1. The bank reserves the right to reject any or all tenders/bids without assigning any reason therof.
2. The tenders shall be submitted in two envelopes. The envelope No. 1 shall be marked as Technical Bid and shall contain Technical Bid of the tender, EMD in the form of Demand Draft/ Pay Order, Prequalification application and any other matter. The envelope No. 2 shall be marked as Price Bid
3. Envelope No. 1. Will be opened on the due date of opening. Envelope No. 2 of the contractors will be opened at later date (to be intimated subsequently) and of those whose prequalification application meets with eligibility criteria of the advertisement and the requirement of EMD and the terms/ conditions submitted, acceptance of technical bid, etc.
4. Tenders are to be submitted in one sealed Envelope Cover Enclosing Therein the Envelope No.1 and Envelope No.2 Duly Superscribed "Tender for Proposed Building for Indian Bank for

   _____"
5. The tenderer must use only the tender forms issued for the purpose to fill in the rates. Intimation of tender quoted by letter, telegram/ telex will not be acceptable. The tender must be dropped in a tender box. Delivery of the tender through courier/ post shall be avoided and any disputes arising thereof shall not be entertained.

6. The rates quoted by the Tenderer shall be based only on the specifications and conditions of the tender documents.
7. Bank is not liable to make any payment to tenderers either for inspection of site or for preparation to submit the tender/bid, regardless of the condut or outcom of the bidding process.
8. Bank reserves the right to cancel the tender of the bidder who fails to submit their tender in the prescribed format of bank.
9. The Companies who are registered with Micro, Small & Medium Enterprises and also those having valid NSIC certificate under Government Store Purchase Programme having certificate clearly indicating the amount of "Quantitative Capacity Per Annum" (amount of Quantitative Capacity Per Annum shall be more than the estimated cost of work) are exempted from the submission of Tender document fee/EMD on submission of requisite proof in the form of valid certification from MSME and NSIC.
10. In case of postal delivery, the tenderer has to ensure that tender is reached before the due date and time and dropped in the tender box. The Bank will not be responsible for damage in the transit and delay of receipt of tender, if any or sent by a special messenger. Tender received after closing date and time of submission of bid shall be rejected.
11. Every page of the tender documents should be signed by the person or persons submitting the tender in token of his/their having acquainted himself/themselves with the General and Special Conditions of Contract, Specifications etc. as laid down. Any tender with any of the documents not so signed will be subjected to rejection.
12. No consideration will be given to a tender received after the time stipulated above and no extension will be allowed for submission of the tender.
13. This notice inviting tenders, the conditions of tender and the duly completed form of tender etc. will form part of the Agreement to be executed by the successful tenderer with the Bank.

DEPUTY ZONAL MANAGER

Indian Bank, Zonal office Mumbai South,

2nd floor, 37, Mumbai Samachar Marg,

Fort, Mumbai 400 023.

Phone No 022-22611145

Email: **zo.mumbai.expprem@indianbank.co.in**

PRE QUALIFICATION DOCUMENT FOR THE

PROPOSED STRUCTURAL REPAIRS, RENOVATION, FLOORING WORK, ELECTRICAL WORK & PAINTING WORKS INDIAN BANK OFFICERS QUARTERS

KARTHIK BUILDING

LOKHANDWALA COMPLEX, ANDHERI (W), MUMBAI 400 102

Sub: PROPOSED STRUCTURAL REPAIRS, RENOVATION, FLOORING WORK, ELECTRICAL WORK & PAINTING WORKS INDIAN BANK OFFICERS QUARTERS KARTHIK BUILDING, ANDHERI WEST

The intending bidders shall fulfill the following minimum **Criteria for pre-qualification** bidding for the above jobs: -

A. 1.0 EXPERIENCE

S.no	Eligible Work	Value – Rs. in Crores
1	**Three** similar (equal to 40%) completed works each costing	1.30
2	**Two** similar (equal to 50%)completed works each costing	1.63
3	**One** similar (equal to 80%)completed work each costing not	2.60

In the Last five years ending 31.3.2021

2.0 Similar work shall mean "Executing RCC Structural repair works, renovation, painting works and Façade works for Multistoried RCC Buildings of atleast GF + 7 floors / Institute Buildings / Large Office spaces / Hospitals / Industrial Buildings or equivalent and Residential Buildings" including the scope of work mentioned ` above, executed in India. Eligible bidders have to submit the TDS certificate issued for the PQ work executed by them along with the Technical bid.

The bidder have One similar WORk shall be completed in any PSU/PSB/ GOVT Body.

3.0 **TURNOVER:** Average annual turnover from the works for the last three years ending 31st March 2021 should not be less than **Rs. 3.00 Crores** as per the audited balance sheet.

4.0 **Profit / Loss: -** Tenderer should be a Net Profit making firm and should not have made losses in the last three continuous financial years.

Certificate(s) from Chartered Accountant / Statutory auditors specifying the net worth of the Applicants, as at the close of the preceding financial year.

5.0 **Solvency Certificate: -** The contractor should have a solvency of the amount of Rs**. 2.00 crores** duly certified by any Scheduled Bank **obtained on or after 01.04.2021**

B . Other conditions

1.0 Interested parties meeting the above Tender criteria can download the tender documentfrom banks website www.indianbank.co.in/tenders and submit experience profile, proof of meeting the above criteria, attested copies of completion / work in progress certificates from the clients, audited certified balanced sheet for the last 3 (three) years, EPF /GST, Registration as Contractor with various PSUs, State PWDs, CPWD, MES, Railways and Autonomous Bodies, details of Technical and Administrative employees, etc., along-with duplicate copy of tender documents including drawings. Application not accompanied by any of the above documents and EMD will be rejected at the discretion of Indian Bank.

2.0 No Joint Venture or consortium of firms shall be allowed.

3.0 Indian Bank reserves the right to verify the authenticity of the documents submitted by the contractors. Indian Bank also reserves the right to reject any or all applications, split the works or cancel the process without assigning any reason whatsoever may be.

4.0 The Tender Application along with its enclosures have to be submitted in duplicate.

5.0 The Panel of pre-qualified contractors shall be initially valid for three year. However Indian Bank reserves the right to curtail or extend at its sole discretion.

6.0 The duly filled in application shall be submitted in a sealed envelop till **30/12/2021 due date and 03:00 PM** at Indian Bank, Zonal office Mumbai South, premises department,2nd floor , 37, Mumbai Samachar Marg, Fort, Mumbai- 400 023.

Superscribing "Tender document for **STRUCTURAL REPAIRS, RENOVATION, FLOORING WORK, ELECTRICAL WORK & PAINTING WORKS INDIAN BANK OFFICERS QUARTERS KARTHIK BUILDING**

DEPUTY ZONAL MANAGER

Indian Bank, Zonal office Mumbai South,

2nd floor,37, Mumbai Samachar Marg,

Fort, Mumbai 400 023. Phone No 022-22611145

SECTION I

INSTRUCTIONS TO TENDERERS
General

1.0 SCOPE OF TENDER BID

1.1 The Employer, as defined in the Tender document, hereinafter called "the Owner," wishes to receive tender documents.

1.2 Throughout these bidding documents, the terms "bid" and "tender" and their derivatives ("bidder"/"tenderer"), "bidered /tendered", "bidding"/"tendering", etc. are Synonymous. Day means calendar day. Singular also means plural.

1.3 The approximate Estimated Value of the works is as indicated in the tender document

2.0 ELIGIBLE TENDERERS

2.1 This Invitation to Tender bid is open to all experienced and reputed Structural repair and façade work Contractors whether Individual or Sole Proprietor, Partnership firm, Private limited, or Public limited Company who satisfy the qualifying criteria. Joint ventures are not accepted.

2.2 The tenderers are required to forward the documents as indicated in the tender documents.

3.0 QUALIFYING CRITERIA

As given in Page No. 8 of this tender document.

Additional Requirement : Even though the tenderers meet the above qualifying criteria, they are liable to be disqualified if they have

(a) Made misleading or false representation in the forms, statements and attachments in proof of the qualification requirements;

(b) Records of poor performance such as abandoning the work, not properly completing the contract, inordinate delays in completion, litigation history or financial failures etc.

(c) Their business banned by any Central Govt. Department/Public Sector Undertakings or Enterprises of Central Govt.

(d) Not submitted all the supporting documents or not furnished the relevant details as per the prescribed format.

(e) Any one of the partners (in case of partnership firm) or any Directors in case of pvt

ltd., or public ltd firm being convicted by a Court of law.

3.1 Tenderer shall submit the general information about them as per ProformaNo-I

3.2 Tenderer shall submit the list of major plant & machinery available with the firm as per Proforma No.- II

4.0 SITE VISIT

4.1 The tenderer is advised to visit **(upon prior approval),** and examine the Site of Works and its surroundings and obtain for itself on its own responsibility and cost all information that may be necessary for preparing the bid and entering into a contract for construction of the Works.

4.2 The tenderer and any of its personnel or agents will be granted permission by the Employer /Owner to enter upon its premises and lands for the purpose of such visit **(upon prior approval),** but only upon the express condition that the tenderer, its personnel, and agents, will release and indemnify the Employer/Owner and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.

4.3 Before submitting a Bid, the Tenderer shall be deemed to have satisfied himself by actual inspection of the site and locality of the works, Traffic conditions/restrictions, Availability of parking space, Transportation of materials that all conditions liable to be encountered during the execution of the works are taken into account and that the rates entered in the Price Bid document are adequate and all inclusive for the completion of work to the entire satisfaction of the Employer/Owner.

5.0 BID OPENING

5.1 Part-I of the Bid (Technical Bid) will be opened at the address and (the date and time intimated in the Notice Inviting tender (NIT)) mentioned in "Tender document" in presence of Tenderers or authorized representatives of Tenderers who wish to attend the opening of Bids.

6.0 PROCESS TO BE CONFIDENTIAL

6.1 Information relating to the examination, clarification, evaluation and comparison of bids, and recommendations for Tender shall not be disclosed to tenderers or any of their persons not officially concerned with such process until the Tender process is finalized.

7.0 EXAMINATION OF BIDS AND DETERMINATION OF RESPONSIVENESS

7.1 The Employer shall examine the bids to determine whether they are complete, whether the documents have been properly signed and whether the bids are

generally in order, and all documents as per tender document have been submitted.

7.2 Prior to the detailed evaluation, Employer shall determine whether each bid is of acceptable quality, is generally complete and is substantially responsive to the tender documents. For purposes of this determination, a substantially responsive bid is one that confirms to all the documents as specified in the Tender document without material deviations, objections, Conditionality or reservation.

A material deviation, objection, conditionality or reservation is one;

a) That affects in any substantial way the scope, quality or performance of the contract.

b) That limits in any substantial way, inconsistent with the bidding documents, the Employers' rights or the successful Tenderer's obligations under the tender document or

c) Whose rectification would unfairly affect the competitive position of other Tenderers who are presenting substantially responsive bids.

7.3 If a bid is determined to be not substantially responsive, it shall be rejected by the Employer.

8.0 EVALUATION OF TENDER BIDS

8.1 The bids, which are determined as substantially responsive, shall be evaluated based upon the criteria as given in qualifying criteria.

8.2 No Tenderer is permitted to canvass to Employer on any matter relating to this Bid. Any Tenderer found doing so is liable to be disqualified and his bid is liable to be rejected.

8.3 The Employer may visit few of the works completed by the tenderers, whom they claim satisfying the eligibility criteria (As a part of tender process).

9.0 The application should be type-written. The applicant should sign and stamp each page of the application.

10.0 Overwriting should be avoided. Correction, if any should be made by neatly crossing out, initialing, dating and rewriting. Pages of the Tender documents are numbered. Additional sheets, if any, added by the contractor, should also be numbered by him.

11.0 Any information furnished by the applicant found to be incorrect either immediately or at a later date, would render him liable to be debarred from Tender / tendering / taking up of work in Indian bank. If such applicant happens to be pre-qualified/ enlisted contractor, his name shall be removed from the pre-qualified list of contractors.

12.0 All information called for in the enclosed forms should be furnished against the relevant columns. If for any reason, information is furnished on a separate sheet, this fact should be mentioned against the relevant column. Even if no information is to be provided in a column, a 'NIL' or 'NO SUCH CASE' entry should be made in that column. If any particulars! Query is not applicable in case of the applicant, it should be stated as "not applicable". The applicants are· cautioned that not giving complete information called for in the application forms or not giving it in clear terms or making any change in the prescribed forms or deliberately suppressing the information may result in the applicant being rejected. Applications/Tender document submitted through Email and Fax without processing fees will not be entertained. The Application/Tender document received after the due date and time of submission shall not be considered.

13. Rates should be quoted both in figures and words in columns specified. All erasures and alterations made while initials of the tenderer must attest filling the tender. Overwriting of figures is not permitted. Failure to comply with either of these conditions will render the tender invalid and it will be the option of Indian Bank to accept or reject the tender. No request of any change in rate or conditions after opening of the tender will be entertained.

14) In the case of figures, the word Rs. should be written before the figures of rupees and the word 'P' written after the decimal figures e.g. Rs. 3.25 P. In the case of words, the word Rupee should similarly precede and the words "Paise only" should be written at the end, closely following each the Item rate. The word "only" should not be written in the next line unless the rate quoted is in whole Rupees closely followed by the word "only". The amount should invariably be upto two decimal places.

15) The different Schedules should be filled as follows:

(a) The "Rate" Column wherever applicable to be legibly filled in ink in both figures and words. (b) The "Amount" Column also to be legibly filled in ink in both figures and words. (c) All corrections to be initialed. (d) No over writing is allowed. (e) The figure of Item of rate shall be legibly filled in ink in both figure and words.

16) Errors in the bill of quantities shall be dealt with in the following manner.

a. In the event of any discrepancy between the rates quoted in words and the rates in figures the former shall prevail. b. In the event of an error occurring in the amount column of the bills of quantities as a result of the wrong extension of the unit rate and the quantity, the unit rate shall be regarded, as firm and extension shall be amended on the basis of the rates. c. All the errors in totaling in the amount column and in carrying forward the totals shall be corrected.

b. The tender shall be signed and dated at all places provided therein. Also all pages, drawings and corrections/ alterations shall be initialed. The tender submitted on behalf of a firm shall be signed by all the partners of the firm or by a partner who has the necessary authority on behalf of the firm to enter into the proposed contract. Otherwise the tender may be rejected by Indian Bank.

17. The time allowed for completion of works is 09 months from the date of commencement of the work is reckoned from the tenth day from the date of Letter of Intent. Time shall be considered the essence of contract.

a. It shall be the responsibility of the contractor to arrange for water and electricity required for completing construction. If water is available with the Bank, the same will be supplied to the contractor by recovering 1% of the value of work done. However, contractor will have to make arrangement of pipeline for distributing water. Contractor to make own arrangement of electricity and pay tariff to the electricity board. In case the Bank is supplying electricity, the contractor will have to install separate energy meter and pay the charges as per its consumption

b. This contract shall be anItem Rate contract. The Contractor shall be paid for actual quantity of work done, as measured at site including any deviation plus or minus. The rate of any non-schedule items of work shall be decided as mentioned in the conditions of contract.

c. The successful tenderer shall be bound to implement the Contract and mobilize and sign specified agreements within 21 days from the date of acceptance of work order.

d. The tender drawings exhibited/enclosed are preliminary drawings intended for the guidance of the Contractor only. They may be subject to revision and alteration without vitiating any of the terms of the contract and the Contractor shall be bound to execute the works as shown on the final drawings without claiming any extra payment.

e. No correspondence will be entertained in respect of this tender other than any clarifications strictly pertaining to this tender.

18) The tender price quoted by a tenderer shall be kept strictly confidential and shall not be divulged to any other party even approximately before the time limit for delivery of tender. The only exception be for obtaining an insurance quotation, you may give your insurance company or agent any essential information they ask for, so long as it is done in strict confidence. No information about other's tender price should be obtained and no arrangement with anyone else should be made whether or not he submit the tender.

19) For electrical, sanitary, water supply and drainage works, tenderers must possess respective valid licenses from the competent authority of the area where the site is located.

20) Contractor should sign at the end of every page prior to submitting the tender.

21) Conditional tenders will be summarily rejected.

22) COMPLETION PERIOD OF THE PROJECT WILL BE 09 months.

Proforma - I

General Information

All individual / firms applying for pre-qualification are requested to complete the information in this form.

1	Name of Tenderer	
2	Head Office Address	
3	Address on which Correspondence should be done.	
	Tel. No.	
	Mobile no.	
	Fax No.	
	E-mail address	
4	Place of incorporation / registration	
5	Constitution of tenderer	
i)	Specify, if the tenderer is	
	a) An individual	
	b) A proprietary firm	
	c) A firm in partnership	
	d) A Limited Company or Corporation	
ii)	Attach a copy of Proprietorship or Partnership Deed or Article of Association or Incorporation of Company as the case may be	
6	Bank solvency	
7	Turn Over for the years given below	
	2018 - 2019	
	2019 - 2020	
	2020 - 2021	
8	Give particulars of registration with Govt. / Semi Govt. / Public Sector Undertakings / Local Bodies.	

9.	Other details: a) EPF No. b) Labour license no c) PAN No. d) GST Registration No. (Copies to be enclosed)	
10.	Any other information considered necessary but not included above	
11.	Names and Titles of Directors and officers with designation to be concerned with this work with Designation of individuals authorized to act for the organization	
12.	Was the applicant ever required to suspend works for a period of more than six months continuously after commencement of works. If so, give the name of the project and give reasons thereof.	
13.	Has the applicant or any constituent partner in case of partnership firm, ever abandoned the awarded work before its completion? If so, give the name of the project and give reasons thereof.	
14.	Has the applicant or any constituent partner in case of partnership firm, ever been debarred / black listed for tendering in any organization at any time? If so, give details	
15.	Has the applicant or any constituent partner in case of partnership firm, ever been convicted by a court of law? If So, give details	

16.	Detailed description and value of works successfully completed during the last five years as mentioned in Page no. 8	
17	Furnish names and address of previous organization for which you have executed similar work in the recent past (At least three)	

Note: Only self attested copies to be furnished.

Date & Place **Signature & seal of the applicant**

PROFORMA - II

List of major Plant and Machinery in possession of the firm

S. No.	Name of Plant & Machinery / equipment	Nos. Available Owned	*Other than col. no. C
A	B	C	D
1			
2			
3			
4			
5			
6			

Signature & seal of the applicant

Date & Place

Note:

* In case of any arrangement for getting the equipment on lease, etc., authenticated proof of the same is to be submitted.
Use separate sheets for providing more information.

PROFORMA II(a)

DETAILS OF KEY TECHNICAL AND ADMINISTRATIVE PERSONNEL EMPLOYED BY

THE FIRM / COMPANY

S.no	Designation	No of staffs	Names	Qualification	Professional Experience	Years of Experience in this firm

Seal and Signature of the applicant

Date and Place

PROFORMA III

FINANCIAL INFORMATION

I Financial Analysis – Details to be furnished duly supported by figures in Balance Sheet/Profit and Loss Account for the last three years ended 31.03.2021 duly certified by the Chartered Accountant, as submitted by the applicant to the Income-Tax Department (Copies to be attached). If the audited statement as of 31.03.2021 is not available, preceding 3 years statements may be furnished. Statement as on 31.03.2021 may be submitted immediately on finalization.

FINANCIAL YEARS	18-19	19-20	20-21

(i) Gross Annual turn-over in Works: mentioned in the NIT

(ii) Profit
or
Loss

(iii) Financial position:

(a) Cash

(b) Current Assets

(c) Current Liabilities

IV) (a) Net Working capital (b-c)

(b)Current Ratio:

Current Assets/Current Liabilities (b/c)

(c) Acid Test Ratio:
Quick Assets/Current Liabilities (a/c)

V. Income Tax clearance Certificate

VI. Solvency certificate from Bankers (Scheduled Bank) of Applicant.

VII. Financial arrangements for carrying out the proposed work

Date and Place

SIGNATURE OF APPLICANT(S) with seal **Signature of Charted Accountant with seal**

PROFORMA IIIA

LIST OF SIMILAR WORKS SATISFYING QUALIFICATION CRITERIA COMPLETED DURING THE LAST 5 YEARS

S.No	Clients Name & Address	Name of the work & Location	Scope of work carried out by the bidder	Agreement/ Letter of Award No. & Date	Contract Value	Date of start	Date of completion	Reasons for delay in Completion, if any	Ref. Or Document (with page no.) in support of meeting Qualification Criterion

PROFORMA IIIB

LIST OF WORKS ON HAND

S.No	Clients Name & Address	Name of the work & Location	Scope of work	Agreement/ Letter of Award No. & Date	Contract Value	Date of start

PROFORMA - IV

Certificate of Credit Facility

(Solvency) (On Bank's letter Head)

This is to certify that M/s _____ , is a reputed firm / company with a good financial standing.

The firm / company is enjoying a fund based credit facility of Rs. _____ to meet its working capital requirements.

Signature

Name, Designation &

Address of Bank

BANK'S SEAL

NOTE: The above certificate shall be from Scheduled Bank.

PROFORMA V

PERFORMANCE REPORT FOR WORKS REFERRED TO IN PROFORMAIII (A)

1. Name of the work / Project & Location.
2. Scope of work.
3. Agreement No.
4. Estimated Cost
5. Tendered Cost
6. Value of work done
7. Date of Start
8. Date of completion

a. Stipulated date of completion.

b. Actual date of completion.

9. Amount of compensation levied for delayed Completion if any.
10. Performance report based on quality of work, Time Management, and Resources : Very Good/Good/Fair/Poor

Date and Place

SUPERINTENDING ENGINEER /
CHIEF PROJECT MANAGER
OR EQUIVALENT.

SPECIAL INSTRUCTIONS TO TENDERERS

1. Time of Completion, Extension of Time & Progress Chart

Time of Completion:

The entire work is to be completed in all respects within the stipulated period of 9 months. The work shall deem to be commenced within fifteen days from the date of issue of Work order or date of handing over of site, whichever is later. Time is the essence of the contract and shall be strictly observed by the Tenderer.

The work shall not be considered as complete until the Architects / Structural Consultant have certified in writing that this has been completed and the Defects Liability Period shall commence from the date of such certificate.

Extension of Time:

If in the opinion of the Indian Bank/Architects / Structural Consultant / /Project Management Consultants the works be delayed (a) by reason of any exceptionally inclement weather, or (b) by reason of instructions from the Indian Bank in consequence of proceedings taken or threatened by or disputes, with adjoining or neighboring owners or (c) by the works, or delay, of other Tenderers or tradesmen engaged or nominated by the Indian Bank and not referred to in the specification or (d) by reason of authorized extra and additions or (e) by reason of any combination of strikes or lock-out affecting any of the building trades of (1) from other causes which the Indian Bank may consider being beyond the control of the Tenderer, the Indian Bank at the completion of the time allowed for the contract shall make fair and reasonable extension of time for completion in respect there for. In the event of the Indian Bank failing to give possession of the site upon the day specified above the time of completion shall be extended suitably.

In case of such strikes or lockouts, as are referred to above, the Tenderer shall, immediately give the Indian Bank, written notice thereof. Nevertheless the Tenderer shall use his best endeavors all that to prevent delay, and shall do all that may be reasonably required to the satisfaction of the Indian Bank to proceed with the works and on his doing so, it will be ground of consideration by the Indian Bank for a extension of time as above provided. the decision of the Indian Bank as to the period to be allowed for an extension of time for completion hereunder (which decision shall be final and binding on the Tenderer) shall be promulgated at the conclusion of such strike or lock-out and the Indian Bank shall then, in the event of an extension being granted, determine and declare the final completion date. The provision in clause 5 with respect to payment of liquidated damages shall in such case, be read and construed as if the extended dated fixed by the Indian Bank were substituted for and the damage shall be deducted accordingly.

Progress of Work:

During the period of construction, the Tenderer shall maintain proportionate progress on the basis of a Programme Chart submitted by the Tenderer immediately before commencement of work and agreed to by the Indian Bank / Architects / Structural Consultant. Tenderer should also include planning for procurement of scarce material well in advance and reflect the same in the Programme Chart so that there is no delay in completion of the project.

2. Defects Liability Period (DLP)

a) It must be realized that this period is for exposure of "latent defects" such as settlements, shrinkages or expansion cracks, undue weathering and wear due to faulty material and workmanship.

b) The DLP commences from the certified date of Virtual Completion issued by the Architects / Structural Consultant. DLP – 1 year from the Date of issue of Virtual Completion Certificate for the work by Architects / Structural Consultant.

c) Whenever the Indian Bank is of the view that the defects in the workmanship and/or materials used are likely to be apparent only over a long period, the Defect Liability Period may be extended as deemed fit.

3. Date of Commencement

Normally, Date of commencement shall be either 15 Days from the Work order issued to the Tenderer or the day on which Tenderer is instructed to take possession of the site, Whichever is later.

4. Date of Completion

Date of completion shall be arrived at after adding the time allowed for the execution of the work to the date of commencement of work.

5. Period of Final Measurement

The period of final measurement after completion shall be made taken into account the complexity of the work and staff available for carrying out measurements.

All hidden works shall have already been measured as the work progressed in presence of Tenderers, Indian Bank, Architects / Structural Consultant and respective specialized consultants to check up the quality and method of installation. It should be noted that unless a longer period is stipulated, the condition of contract generally lays down three months (maximum) from the date of completion of the contract as the period of final measurement. Even though the maximum period of three months is mentioned, it shall be endeavored to complete the measurements as expeditiously as possible.

6. **Period of Honoring Interim Certificate**

The period shall be Fifteen days from the date of receipt of the certificate from the Architects / Structural Consultant along with M Book only signed by the Tenderer consultants & Architects / Structural Consultant .

7. Period of Honoring Final Certificate

The period shall be one month from the date of receipt of the final bill certificate from the Architects / Structural Consultant along with M book duly signed by Tenderer, Consultant and Architects / Structural Consultant and statutory Certificates wherever necessary along with as built drawings of the works executed. No due certificate from self as well as from the sub agencies involved by the main contractor should be produced to the bank at the time of submitting final bill by the main contractor.

8. Retention Money

The retention percentage (I.e. deduction from interim bill) shall be 5% of the Gross value of each interim bill. The maximum amount of retention money shall be the balance amount of the Total Security Deposit. 50% of the retention amount will be refunded to the Tenderer on completion subject to the following:

- Issue of Virtual Completion Certificate by the Architects / Structural Consultant .

Tenderer's removal of his materials, equipment, labour force, temporary sheds/stores etc. from the site. (excepting for a small presence required if any for the Defect Liability Period and approved by the Indian Bank) The remaining 50% of the amount may be refunded 14 (Fourteen) days after the end of defects liability period provided he has satisfactorily carried out all the works and attended to all defects in accordance with the conditions of the Contract, including site clearance.

9. Receiving, Opening and Recording of Tenders

Part-A (Technical bid) has to be submitted in duplicate with one set of drawings. The tenderers are required to submit the tender documents marked "*Original*" and "*Duplicate*" in Part-A.

Part-A tender will be opened at **15.30** hours on the same day as the last day of the receipt. In case of postal delivery, the tenderer has to ensure that the tender is received before the due date and time. The Indian Bank will not be responsible for the damage in transit and delay in receipt of tender if any. Further, Indian Bank will not entertain any claims/correspondences in this matter.

After technical evaluation, intimation will be given to all qualifying bidders about the date, time of opening of Manual Price bid.

GENERAL CONDITIONS OF CONTRACT

Except where provided for in the description of the individual items in the schedule of quantities and in the specifications and conditions laid down hereinafter and in the Drawings, the work shall be carried out as per standard specifications and under the direction of Architects / Structural Consultants.

1. Interpretation

In construing these conditions, the specifications, the schedule of quantities, tender and Agreement, the following words shall have the meaning herein assigned to him except where the subject or context otherwise requires:

i. Indian Bank: The term Indian Bank shall denote Indian Bank with their Zonal office Mumbai South at 2nd Floor, 37, Mumbai Samachar Marg, Fort, Mumbai 400 023 and any of its employees representative authorized on their behalf.

ii. Tenderer: The term 'Tenderer' shall mean the individual or firm or company whether incorporated or not, undertaking the work and shall include legal representative(s) of such individuals or persons composing such firm or company or successors of such firm or company as the case may be and permitted assigns of such individual or firm or company.

iii. Site: The site shall mean the site where the works are to be executed as shown within boundary in red border on the site plan including any building and erections thereon allotted by the Indian Bank for the Tenderer's use.

iv. Drawings: The work is to be carried out in accordance with drawings, specifications, the schedule of quantities and any further drawings which may be supplied or any other instruction, which may be given by the Indian Bank during the execution of the work.

All drawings relating to work given to the Tenderer together with a copy of schedule of quantities are to be kept at site and the Architects / Structural Consultant shall be given to such drawings or schedule of access whenever necessary.

In case any detailed Drawings are necessary Tenderer shall prepare such detailed drawings and or dimensional sketches there for and have it confirmed by the

Indian Bank/ Architects / Structural Consultant / Structural Consultant /PMC as case may be prior to taking up such work.

The Tenderer shall ask in writing for any clarifications.

v. "The Works" Shall mean the work or works to be executed or done under this contract.

vi. "Act of Insolvency" shall mean any act as such as defined by the Presidency Towns Insolvency act or in Provincial Insovency Act or any amending Statutes.

vii. "The Schedule of Quantites" shall mean the schedule of quantities as specified and forming part of this contract.

viii. "Priced Schedule of Quantities" shall mean the schedule of quantities duly priced with the accepted quoted rates of the Tenderer.

2. Tenders

a) Technical Bid

The entire set of tender paper issued to the tenderer should be submitted fully signed on the every page. Signature will indicate the acceptance of the tender papers by the tenderer.

b) Price Bid - The price should be quoted in the Price Bid format attached to this bid.

The schedule of quantities shall be filled in as follows:

a) The "Rate" column to be legibly filled in ink both English figures and English words.

b) Amount column to be filled in for each item and the amount for each sub head as detailed in the" Schedule of Quantities".

c) All corrections are to be initialed.

d) The "Rate Column" for alternative items shall be filled up.

e) The" Amount" column for alternative items of which the quantities are not mentioned shall not be filled up.

No modifications, writings or corrections can be made in the tender papers by the tenderer, but may at his option offer his comments or modifications in a

separate sheet of paper attached to the original tender papers.

The Indian Bank reserves the right to reject the lowest or any tender and also to discharge any or all of the tenders for each section or to split up and distribute any item of work to any specialist firm or firms, without assigning any reason.

The tenderers should note that the tender is strictly on the item rate basis and their attention is drawn to the fact that the rates for each and every item should be correct, workable and self-supporting. If called upon by the Indian Bank/ Architects / Structural Consultant detailed analysis of any or all the rates shall be submitted. The Indian Bank/ Architects / Structural Consultant shall not be bound to recognize the Tenderer's analysis.

The works will be paid for as "measured work" on the basis of actual work done and not as "lump sum" contract, unless otherwise specified.

All items of work described in the schedule of quantities are to be deemed and paid as complete works in all respects and details including preparatory and finishing works involved, directly, related to and reasonably detectable from the drawings, specifications and schedule of quantities and no further extra charges will be allowed in this connection. In the case of lump-sum charges in the tender in respect of any item of works, the payment of such items of work will be made for the actual work done on the basis of lump-sum charges as will be assessed to be payable by the Indian Bank.

The Indian Bank has power to add to, omit from any work as shown in drawings or described in specifications or included in schedule of quantities and intimate the same in writing but no addition, omission or variation shall be made by the Tenderer without authorization from the Indian Bank. No variation shall vitiate the contract. Please also refer to para 9 hereinafter.

The tenderer shall note that his tender shall remain open for consideration for a period as specified in General rules and Instructions under Item no 10. from the date of opening of the price - tender of the tender .

3. Agreement

The successful Tenderer is required to sign agreement as may be drawn up to suit local conditions and shall pay for all stamps and legal expenses, incidental thereto.

4. Permits and Licenses

Permits and licenses for release of materials which are under Government control will be arranged by the Tenderer. The Indian Bank will render necessary assistance, sign any forms or applications that may be necessary.

The Indian Bank/ Architects / Structural Consultant / PMC shall be indemnified against all Government or legal actions for theft or misuse of cement M.S. rods and any controlled materials in the custody of the Tenderer.

It may be clearly understood that no compensation or additional charges can be claimed by the tenderer for non-availability of such materials in due time on this account or according to his own requirements.

5. Government and Local Rules

The Tenderer shall conform to the provisions of all local Bye-laws and Acts relating to the work and to the Regulations etc., of the Government and Local Authorities and of any company with whose system the structure is proposed to be connected. The Tenderer shall give all notices required by said Act, Rules, and Regulations and Bye-laws etc., and pay all fees / fines payable to such authority / authorities for execution of the work involved. The cost, if any, shall be deemed to have been included in his quoted rates, taking into account all liabilities for licenses, fees for footpath encroachment and restorations etc., and shall indemnify the Indian Bank against such liabilities and shall defend all actions arising from such claims or liabilities.

6. Taxes and Duties

The tenderers must include in their tender prices quoted for all duties royalties, cess and sale tax or any other taxes or local charges if applicable. GST will be payable extra as applicable.

No extra claim on this account will in any case be entertained.

The tenderer shall keep necessary books of A/C & other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by duly authorized representative of the Indian Bank and or the Engineer-in-charge and further shall furnish such other information / document as the Indian Bank may required from time to time.

7. Quantity of Work to be executed

The quantities shown in the schedule of quantities are intended to cover the entire new structure indicated in the drawings but the Indian Bank reserves the right to execute only apart or the whole or any excess thereof without assigning any reason therefore. Variation in the value is however not expected to be more than 25%.

8. Other Persons Engaged by the Indian Bank

The Indian Bank reserves the right to execute any part of the work included in this contract or any work which is not included in this contract by other Agency or persons and Tenderer shall allow all reasonable facilities and use of his

scaffolding for the execution of such work. The main Tenderer shall extend all cooperation in this regard.

9. Earnest Money and Security Deposit

The tenderer will have to deposit an amount of Rs.2,67,000/- (Rupees Two Lakh Sixty Seven Thousand Only) in the form of Bankers Demand Draft in favour of " Indian Bank," payable at Mumbai at the time of submission of tender as an Earnest Money. The Indian Bank is not liable to pay any interest on the Earnest Money. The Earnest Money of the unsuccessful tenderers will be refunded without any interest soon after the acceptance of the selected tenderder after award of work or after the expiry of the validity period of the tender

Apart from the EMD, retention money shall be deducted from progressive running bills @ 5% of the gross value of each running bill until the Total Security Deposit, i.e., EMD and the retention money equals 7% of the project cost. 50% of the total security deposit shall be released on successful completion of the works and after obtaining Virtual completion certificate from the Architects / Structural Consultant and No Claim certificate by the tenderder to the Indian Bank.

The balance retention amount 50% will be refunded after the end of defects liability period as mentioned in point no.2 of this special condition of contract provided he has satisfactorily carried out all the work and attended to all defects in accordance with the conditions of the contract. No interest is allowed on retention money. A part of the Security Deposit if and as decided by a constituent Indian bank can also be furnished in the form of a Indian bank guarantee on a Indian bank other than that of the constituent Indian bank

10. Tenderer to provide everything necessary

The Tenderer shall provide everything necessary for the proper execution of the work according to the intent and meaning of the drawings, schedule of quantities and specifications taken together whether the same may or may not be particularly shown or described therein provided that the same can reasonably be inferred there from and if the Tenderer finds any discrepancies therein he shall immediately and in writing, refer the same to Indian Bank/ Architects / Structural Consultant PMC whose decision shall be final and binding.

The Tenderer shall provide himself for ground and fresh water for carrying out of works at his own cost. The Indian Bank shall on no account be responsible for the expenses incurred by the Tenderer for hired ground or fresh water obtained from elsewhere.

The rates quoted against individual items will be inclusive of everything necessary to complete the said items of work within the contemplation of the contract, and beyond the unit price no extra payment will be allowed for

incidental or contingent work, labour and/or materials inclusive of all taxes and duties whatsoever except for specific items, if any, stipulated in the tender documents.

The Tenderer shall supply, fix and maintain at his own cost, for the execution of any work, all tools, tackles, machineries and equipments and all the necessary centering, scaffolding, staging, planking, timbering, strutting, shoring, pumping, fencing, boarding, watching and lighting by night as well as by day required not only for the proper execution and protection of the said work but also for the protection for the public and safety of any adjacent roads, streets, walls, houses, buildings, all other erections, matters and things and the Tenderer shall take down and remove any or all such centering, scaffolding, planking, timbering, strutting, shoring, etc., as occasion shall be required or when ordered so to do, and shall fully reinstate and make good all matters and things disturbed during the execution of the works to the satisfaction of the Indian Bank/ Architects / Structural Consultant.

The Tenderer shall also provide such temporary road on the site as may be necessary for the proper performance of the contract, and for his own convenience but not otherwise. Upon completion, such roads shall be broken up and leveled where so required by the drawings unless the Indian Bank shall otherwise direct. The Tenderer shall at all times give access to workers employed by the Indian Bank or any men employed on the buildings and to provide such parties with proper sufficient and if required, special scaffolding, hoists and ladders and provide them with water and lighting and leave or make any holes, grooves etc., in any work, where directed by the Indian Bank as may be required to enable such workmen to lay or fix pipes, electrical wiring, special fittings etc. The quoted rates of the tenderers shall accordingly include all these above mentioned contingent works.

11. Tools, Storage of Materials, Protective Works and Site Office Requirements

The Tenderer shall maintain a site office with site engineer to receive instruction notices or communications etc.

All drawings maintained on the site are to be carefully mounted on boards of appropriate size and covered with a coat of approved varnish. They are to be protected from ravages of termites, ants, and other insects. The Tenderer shall provide at his own cost all artificial light required for the work and to enable other Tenderers and sub-Tenderers to complete the work within the specified time.

The Tenderer shall use the toilets identified by the Indian bank for use of their workmen and keep the same in a clean and sanitary condition to the satisfaction of the Indian bank / Public Health Authorities and shall cause such latrines and soil to be cleared away whenever necessary and shall make good all the works

disturbed by these conveniences.

Every precaution shall be taken by the Tenderer to prevent the breeding of mosquitoes on the works during the construction, and all receptacles; cisterns, water tanks etc., used for the storage of water must be suitably protected against breeding of mosquitoes.

The Tenderer shall indemnify the Indian Bank against any breach of rules in respect of anti-malarial measures.

The Tenderer shall not fix or place any placards or advertisement of any description or permit the same to be fixed or placed in or upon any boarding, gantry , building structure other than those approved by the Indian Bank.

Protective Measures: The Tenderer from the time of being placed in possession of the site must make suitable arrangements for watching, lighting and protecting the work, the site and surrounding property by day, by night, on Sundays and other holidays.

Tenderer shall indemnify the Indian Bank against any possible damage to the building, roads, or members of the public in course of execution of the work.

The Tenderer shall provide necessary temporary enclosures, gates, entrances, etc., for the protection of the work and materials and for altering and adopting the same as may be required and removing on completion of the works and making good all works disturbed.

Storage of materials: The Tenderer shall provide and maintain proper sheds for the proper storage and adequate protection of the materials etc. and other work that may be executed on the site including the tools and materials of sub- Tenderers and remove same on completion. Cement should be stored one feet above the ground level and have raised floor.

Tools: The theodolite levels, steel and metallic tapes and all other surveying instruments found necessary on the works shall be provided by the Tenderer for the due performance of this contract as instructed by the Site Engineer. All measuring tapes shall be of steel and suitable scaffolding and ladders that may be required for safely taking measurement shall be supplied by the Tenderer.

The masteries and the supervisors on the works shall carry with them always a one meter or two meter steel tape, a measuring tape of 3 meters, a spirit level, a plumb bob and a square and shall check the work to see that the work is being done according to the drawing and specifications. The Site Engineer will use any or all measuring instruments or tools belonging to the Tenderers as he chooses for checking the works executed or being executed on the contract. The Tenderer should cover in his rates for making provisions for all reasonable facilities for the

use of his scaffolding, tools and plant etc. by sub-Tenderers for their work.

12. Notice and Patents of Appropriate Authority and Owners

The Tenderer shall confirm to the provisions of any Acts of the Legislature relating to the work, and to the Regulations and Bye- laws of any authorities, and/or any water, lighting and other companies, and/or authorities with whose systems the structures were proposed to have connection and shall before making any variations from the drawings or specification that may be associated to so conform, give the Indian Bank/ Architects / Structural Consultant written notices specifying the variations proposed to be made and the reasons for making them and apply for instruction thereon. The Indian Bank/ Architects / Structural Consultant on receipt of such intimation shall give a decision within a reasonable time.

The tenderer shall arrange to give all notices required for by the said acts, regulations or bye-laws to be given to any authority, and to pay to such authority or to any public officer all fees that may be properly chargeable in respect of the work and lodge the receipts with the employer.

The tenderer shall indemnify the employer against all claims in respect of patent rights, royalities, damages to buildings, roads or members of public in course of execution of work and shall defend all actions arising from such claims and shall keep the employer saved harmless and indemnified in all respects from such actions, costs and expenses.

13. Clearing Site and Setting out Works

The site shown on the plan shall be cleared of all obstructions, loose stone, and materials rubbish of all kinds. All holes or hollows whether originally existing or produced by removal or loose stone or materials shall be carefully filled up with earth well rammed and leveled off as directed at his own cost. The Tenderer shall set out the works and shall be responsible for the true and perfect setting out of the work and for the correctness of the positions, levels, dimensions and alignment of all parts thereof. If at any time, any error shall appear during the progress of any part of the work, the Tenderer shall at his own expenses rectify such error, if called upon to the satisfaction of the Indian Bank. The Tenderer shall further set out the works to the alternative positions at the site until one is finally approved and the rates quoted in his tender should include for this and no extra on this account will be entertained.

14. Tenderer Immediately to Remove All Offensive Matters

The Tenderer shall keep the foundations and works free from water and shall provide and maintain at his own expenses electrically or other power driven pumps and other plant to the satisfaction of the Indian Bank for the purpose, until the building is handed over to the Indian Bank. The Tenderer shall arrange for the disposal of the water so accumulated to the satisfaction of the Indian Bank and local authority and no claims will be entertained afterwards if he does not include in

his rates for the purpose.

15. Access

Any authorized representative of the Indian Bank shall at all reasonable times have free access to the works and/or to the, workshops, factories or other places where materials are being prepared or constructed for the work and also to any place where the materials are lying or from where they are being obtained, and the Tenderer shall give every facility to the Indian bank or their representatives necessary for inspection and examination and test of the materials and workmanship. Except the representatives of the Indian Bank no person shall be allowed at any time without the written permission of the Indian Bank.

16. Materials, Workmanship, Samples, Testing of Materials

All the works specified and provided for in the specifications or which may be required to be done in order to perform and complete any part thereof shall be executed in the best and most workmanlike manner with materials of the best and approved quality of the respective kinds in accordance with the particulars contained in and implied by the specifications and as represented by the drawings or according to such other additional particulars, and instructions as may from time to time be given by the Indian Bank/ Architects / Structural Consultant during the execution of the work, and to his entire satisfaction.

If required by the Indian Bank/ Architects / Structural Consultant the Tenderer shall have to carry out tests on materials and workmanship in approved materials testing laboratories or as prescribed by the Indian Bank/ Architects / Structural Consultant at his own cost to prove that the materials etc. Under test conform to the relevant I.S. Standards or as specified in the specifications. The necessary charges for preparation of mould (in case of concrete cube) transporting, testing etc., shall have to be borne by the Tenderer. No extra payment on this account should in any case be entertained.

All works to be carried out generally as per BIS Specifications. Branded items, i.e., BIS compliant items specified in the tender shall not be tested separately. However the other items if approved by Indian bank are subjected to testing as per tender specifications.

All the materials (except where otherwise described) stores and equipment required for the full performance of the work under the contract must be provided through normal channels and must include charge for import duties, sales tax, octroi and other charges and must be the best of their kind available and the Tenderers must be entirely responsible for the proper and efficient carrying out of the work. The work must be done in the best workmanlike manner. Samples of all materials to be used must be submitted displayed to the Indian Bank/ Architects / Structural Consultant when so directed by the Engineer/ Architects / Structural Consultant and written approval from Indian Bank/ Architects / Structural Consultant

must be obtained prior to placement of order.

During the inclement weather the Tenderer shall suspend concreting and plastering for such time as the Indian Bank/ Architects / Structural Consultant may direct and shall protect from injury all work when in course of execution. Any damage (during constructions) to any part of the work for any reasons due to rain, storm, or neglect of Tenderer shall be rectified. by the Tenderer in an approved manner at no extra cost.

Should the work be suspended by reason of rain, strike, lock -outs or any other cause, the Tenderer shall take all precautions necessary for the protection of work and at his own expenses shall make good any damage arising from any of these causes.

The Tenderer shall cover up and protect from damage, from any cause, all new work and supply all temporary doors, protection to windows, and any other requisite protection for the execution of the work whether by himself or special tradesmen or sub-Tenderer and any damage caused must be made good by the Tenderer at his own expenses.

The contractor shall prepare for approval of Architects / Structural Consultant the "Co-ordinated services drawings" for pre-planned openings so that the alterations are reduced to the minimum.

17. Removal of Improper Work

The Indian Bank shall during the progress of the work have power to order in writing from time to time the removal from the work within such reasonable time or times as may be specified in the order of any materials which in the opinion of the Indian Bank / Architects / Structural Consultant are not in accordance with specification or instructions, the substitution or proper re-execution of any work executed with materials or workmanships not in accordance with the drawings and specifications or instructions. In case the Tenderer refuses to comply with the order the Indian Bank shall have the power to employ and pay other agencies to carry out the work and all expenses consequent thereon or incidental thereto as certified by the Indian Bank/ Architects / Structural Consultant shall be borne by the Tenderer or may be deducted from any money due to or that may become due to the Tenderer. No certificate which may be given by the Architects / Structural Consultant shall relieve the Tenderer from his liability in respect of unsound work or bad materials.

18. Site Engineer/Project Management Consultant:

The term "Site Engineer/PMC" shall mean the person/agencies appointed and paid by the Indian Bank to superintend the work. The Tenderer shall afford the

Site Engineer/PMC every facility and assistance for examining the works and materials and for checking and measuring work and materials. The Site Engineer/PMC shall have no power to revoke, alter, enlarge or relax any requirements of the Tenderer or to sanction any day work, additions, alterations, deviations or omissions or any extra work whatever, except in so far as such authority may be specially conferred by a written order of the Indian Bank.

The Site Engineer/PMC shall have power to give notice to the Tenderer or to his foreman, of non-approval of any work or materials and such work shall be suspended or the use of such materials shall be discontinued until the decision of the Indian Bank is obtained. The work will from time to time be examined by the Architects / Structural Consultant / Structural Consultant , Engineer from the Premises Department of the Indian Bank and the Site Engineer if any. But such examination shall not in any way exonerate the Tenderer from the obligation to remedy any defects which may be found to exist at any stage of the work or after the same is complete. Subject to the limitations of this clause the Tenderer shall take instructions only from the Architects / Structural Consultant / Structural Consultant /Indian Bank or his representative.

19. Tenderer's Employees

The Tenderer shall employ technically qualified and competent supervisors for the work who shall be available (by turn) throughout the working hours to receive and comply with instructions of the Indian Bank/ Architects / Structural Consultant / Structural Consultant . The Tenderer shall engage at least one experienced Engineer as site-in-charge for execution of the work. The Tenderer shall employ in connection with the work persons having the appropriate skill or ability to perform their job efficiently. The Tenderer shall employ local labourers on the work as far as possible. No labourer below the age of Eighteen years and who is not an Indian National shall be employed on the work.

Any labourer supplied by the Tenderer to be engaged on the work on day-work basis either wholly or partly under the direct order or control of the Indian Bank or his representative shall be deemed to be a person employed by the Tenderer.

The Tenderer shall comply with the provisions of all labour legislation including the requirements of

a) The Payment of Wages Act 1936
b) Indian Bank's Liability Act 1938
c) Workmen's Compensation Act Contract Labour (Regulation & Abolition) Act, 1970 and Central Rules 1971.
d) Apprentices Act 1961
e) Minimum Wages Act 1948
f) Any other Act or enactment relating thereto and rules framed

there Under from time to time.

The Tenderer shall keep the Indian Bank saved harmless and indemnified against claims if any of the workmen and all costs and expenses as may be incurred by the Indian Bank in connection with any claim that may be made by any workmen.

The Tenderer shall comply at his own cost with the order of requirement of any Health Officer of the State or any local authority or of the Indian Bank regarding the maintenance of proper environmental sanitation of the area where the Tenderer's laborers are housed or accommodated, for the prevention of small pox, cholera, plague, typhoid, malaria and other contagious diseases. The Tenderer shall provide, maintain and keep in good sanitary condition adequate sanitary accommodation and provide facilities for pure drinking water at all times for the use of men engaged on the works and shall remove and clear away the same on completion of the works. Adequate precautions shall be taken by the Tenderer to prevent nuisance of any kind on the works or the lands adjoining the same.

The Tenderer shall arrange to provide first-aid treatment to the laborers engaged on the works. He shall within 24 hours of the occurrence of any accident at or about the site or in connection with execution of the works, report such accident to the Indian Bank and also to the Competent Authority where such report is required by law. Compliance of labour regulations:

20. Dismissal of Workmen

The Tenderer shall on the request of the Indian Bank immediately dismiss from works any person employed thereon by him, who may in the opinion of the Indian Bank be unsuitable or incompetent or who may misconduct himself. Such discharge shall not be the basis of any claim for compensation or damages against the Indian Bank or any of their officer or employee.

21. Assignment

The whole of the works included in the contract shall be executed by the Tenderer and the Tenderer shall not directly or indirectly transfer, assign or underlet the contract or any part, share or interest therein nor, shall take a new partner, without written consent of the Indian Bank and no subletting shall relieve the Tenderer from the full and entire responsibility of the contract or from active superintendence of the work during their progress.

22. Damage to Persons and Property Insurance Etc.

The Tenderer shall be responsible for all injury to the work or workmen to persons, animals or things and for all damages to the structural and/or decorative part of property which may arise from the operations or neglect of himself or of any sub- Tenderer or of any of his or a sub-Tenderer's employees, whether such injury or damage arise from carelessness, accident or any other cause whatsoever

in any way connected with the carrying out of this contract. The clause shall be held to include inter-alia, any damage to buildings whether immediately adjacent or otherwise, and any damage to roads, streets, foot paths or ways as well as damages caused to the buildings and the works forming the subject of this contract by rain, wind or other inclemency of the weather. The tenderer shall be responsible for the damages/injury/accidents caused to any public in general / vehicles in general and pay necessary compensation or settlement or whatsoever in this regard.

The Tenderer shall indemnify the Indian Bank and hold harmless in respect of all and any expenses arising from any such injury or damages to persons or property as aforesaid and also in respect of any claim made in respect of injury or damage under any acts of compensation or damage consequent upon such claim.

The Tenderer shall reinstate all damage of every sort mentioned in this clause, so as to deliver the whole of the contract works complete and perfect in every respect and so as to make good or otherwise satisfy all claims for damages to the property or third parties.

The Indian Bank shall be at liberty and is hereby empowered to deduct the amount of any damages, compensations, costs, charges and expenses arising or accruing from or in respect of any such claim or damages from any sums due or to become due to the Tenderer .

23. Insurance

The Tenderer shall arrange to take "Tenderers all risk insurance policy including third party liability", covering the entire period of contract till virtual completion of the contract (including extended period if any) for the entire scope of works for a risk cover not less than the contract value. The third party insurance shall be for a sum of Rs. 5 Lakh per accident.

The Tenderer shall effect the insurance necessary and indemnify the Indian Bank entirely from all responsibility in this respect. The insurance must be placed with a company approved by the Indian Bank and must be effected jointly in the name of the Tenderer and the Indian Bank and the policy lodged with the latter. The scope of insurance is to include damage or loss to the work and workman due to carelessness accident, including fire, earthquake and floods etc., damage or loss to the contract itself till this is made over in a complete state. Insurance is compulsory and must be effected from the very initial stage.

The Tenderer shall also be responsible for anything which may be excluded from damage to any property arising out of incidents, negligence or defective carrying out of this contract.

Unless otherwise instructed the Tenderer shall insure the works and keep them

insured until the virtual completion of the contract against loss or damage by fire and /or earthquake, flood. The insurance must be placed with a company approved by the Indian Bank, in the joint names of the Indian Bank and the Tenderer for such amount and for any further sum if called to do so by the Indian Bank, the premium of such further sum being allowed to the Tenderer as an authorized extra.

The Tenderer shall as soon as the claim under the policy is settled or the work reinstated by the Insurance Company should they elect to do so, proceed with due diligence with the completion of the works in the same manner as though the fire has not occurred and in all respects under the conditions of the contract. The Tenderer in case of rebinding or reinstatement after fire shall be entitled to extension of time for completion as the Indian Bank may deem fit.

24. Accounts, Receipts & Vouchers

The Tenderer shall, upon the request of the Indian Bank furnish them, with all the invoices, accounts, receipts and other vouchers that they may require in connection with the works under this contract. If the Tenderer shall use materials less than what he is required under the contract, the value of the difference in the quantity of the materials he was required to use and that he actually used shall be deducted from his dues. The decision of the Indian Bank shall be final and binding on the Tenderer as to the amount of materials the Tenderer is required to use for any work under this contract.

25. Measurement

All the Measurements should be taken in the presence of Bank officials/ Architects / Structural Consultant / Structural Consultant . And the measurements shall be countersigned by the Bank officials.

26. Payments

All bills shall be prepared by the Tenderer in the form prescribed by the Indian Bank / Architects / Structural Consultant. **Normally one interim bill shall be prepared each month subject to minimum value for interim certificate as stated in these documents.** The bills in proper forms must be duly accompanied by detailed measurements in support of the quantities of work done and must show deductions for all previous payments, retention money, etc.

The Indian Bank/ Architects / Structural Consultant shall issue a certificate after due scrutiny of the Tenderers' bill stating the amount due to the Tenderer from the Indian Bank and the Tenderer shall be entitled to payment thereof, within the period of honoring certificates named in these documents. In case of delay due to some reasons in the processing of such bills for payment, an advance of 75%

of the billed Amount may be paid on the request of the Tenderer for the smooth progress of the work. The amount stated in an interim certificate shall be the total value of work properly executed and 75% of invoiced value of material brought to site for permanent incorporation into the work up to the date of the bill less the amount to be retained by the Indian Bank as retention money vide clause 11 of the general conditions of contract, less TDS, and less installments previously paid under these conditions, provided that such certificate shall only include the value of said material and goods as and from such time as they are reasonably, properly and not prematurely brought to or placed adjacent to the work and then only if adequately protected against weather or other causalities.

The Indian Bank will deduct retention money as per tender conditions. If the Indian Bank has supplied any materials or goods to the Tenderer, the cost of any such materials or goods will be, progressively deducted from the amount due to the Tenderer in accordance with the quantities consumed in the work.

All the interim payments shall be regarded as payments by way of advance against the final payment only and not as payments for work actually, done and completed, and shall not preclude the Requiring of bad, unsound, and- imperfect or unskilled work to be; removed and taken away and reconstructed, or re-erected or be considered as an admission of the due performance of the contract, or any part thereof in any respect or the accruing of any claim, nor shall, it conclude, determine or affect in anyway the power of the Indian Bank under these conditions or any of them as to the final settlement and adjustment of the accounts or otherwise or in any other way vary or affect the contract. The final bill shall be submitted by the Tenderer within one month of the date fixed for completion of the work or of the date of certificate of completion furnished by the Site Engineer and payment shall be made after checking the work completely. Payment will be made 75 % against supply of materials & 25 % against erection and commissioning, less statutory deductions.

Indian Bank reserves the right to withhold in part or full payment of bills in case of non-compliance / violation of any terms and conditions stipulated in the agreement. The tenderer shall neither suspend the work nor claim for extension of time for non-payment /withholding of payment on this account and no interest is also payable on the payment withheld/due.

27. Final Payment

The final bill shall be accompanied by a certificate of completion from the Consultants & Architects / Structural Consultant / Structural Consultant . Payments of final bill shall be made after deduction of Retention Money, which sum shall be refunded after the completion of the Defects Liability Period after

receiving the Indian Bank's/ Architects / Structural Consultant / Structural Consultant ' certificate that the Tenderer has rectified all defects to the satisfaction of the Indian Bank/ Architects / Structural Consultant / Structural Consultant . The acceptance of payment of the final bill by the Tenderer would indicate that he will have no further claim in respect of the work executed.

The contractor has to submit 2 copies of "As built drawings" of A2 or A1 size and CD duly certified by the Architects / Structural Consultant to the Bank along with final bill documents. Along with Every bill the contractor has to submit the photographs of the work executed

28. ENHANCEMENT IN RATES AND QUANTITY VARIATION

The tender rates shall be fixed, firm and applicable for any increase or decrease in the tendered quantities. The Employer / Architects / Structural Consultant can increase or decrease any quantities to any extent or even delete particular item as per the site requirements and the contractor shall not be paid anything extra on thisaccount. Nothing extra will be paid by the Indian Bank on account of omission /deletion of items or decrease in the quantity of items. The Bank shall not entertain any claim whatsoever from the contractor on this account.The price of all additional items / non-tendered items will be worked out onthe basis of rates quoted for similar items in the contract wherever existing. Ifsimilar items are not available, the rates for such items will be derived as per standard method of rate analysis based on prevalent fair price of labour,material and other components as required with 15% towards contractor'sprofit and overheads.

29. UNQUOTED ITEMS

The bidders to offer their competitive rates for each and every item listed in the Schedule of rates, the bidders who have not quoted for all the items as required in the SORs shall be liable for rejection. In case a bidder who has left certain items unquoted and if they happen to be overall lowest on evaluation, then their offers shall be considered subject to the unquoted items being taken as NIL cost. The bidder shall also give a clear undertaking to the effect that they shall execute the said items (unquoted) free of cost. In the event the bidder refuses the above conditions and insists on additional cost for the unquoted items, then such an offers shall be rejected as invalid.

For Extra works at the time of work in progress the contractor should submit the reasonable rate with the rate analysis and after approval given by the Architects / Structural Consultant / Bank that amount will be given.

30. ABNORMAL RATES

The Contractor is expected to quote rate for each items after careful analysis of costs involved for the performance of the complete item consisting all specifications and conditions of the contract. If it is noticed that the rates quoted by the tenderer for any items are unusually high (or) unusually low it will be sufficient cause for rejection of the tender unless the Indian Bank is convinced about the reasonableness of the rate on scrutiny of the analysis for such rate to be furnished by the tenderer on demand. Not with standing anything there in stand, the rate once accepted by the Indian Bank shall be final and shall not be subject to any claim either on account of un-workability of rates or on any other ground whatsoever.

31. Substitution

Should the Tenderer desire to substitute any materials and workmanship, he/they must obtain the approval of the Indian Bank/ Architects / Structural Consultant in writing for any such substitution well in advance. Materials designated in this specification indefinitely by such term as "Equal" or "Other approved" etc. specific approval of the Indian Bank/ Architects / Structural Consultant has to be obtained in writing prior to the execution.

32. Preparation of Building Works for Occupation and Use on Completion

The whole of the work will be thoroughly inspected by the Tenderer and deficiencies and defects put right. On completion of such inspection the Tenderer shall inform the Indian Bank that he has completed the work and it is ready for inspection. On completion the Tenderer shall clean all windows and doors including the cleaning and oiling if necessary, of all hardware, inside and outside, all floors, stair-cases, and every part of the building. He will leave the entire building neat and clean and ready for immediate occupation and to the satisfaction of the Indian bank.

33. Clearing Site on Completion

On completion of the works the Tenderer shall clear away and remove from the site all constructional plant, surplus materials, rubbish and temporary works of every kind and leave the whole of the site and the works clean and in a workman like condition to the satisfaction of the Indian Bank/ Architects / Structural Consultant.

The main /Principal contractor is only responsible for the cleanliness of the site/building irrespective of numbers of sub agencies deployed by them to carryout various other works in the tender.

34. Defects after Completion

The Tenderer shall make good at his own cost and to the satisfaction of the Indian Bank all defects, shrinkage, settlements or other faults which may appear within 12 months after completion of the work. In default the Indian Bank may employ and pay other persons to amend and make good such damages, losses and expenses consequent thereon or incidental thereto shall be made good and borne by the Tenderer and such damages, loss and expenses shall be recoverable from him by the Indian Bank or may be deducted by the Indian Bank, in lieu of such amending and making good by the Tenderer, deduct from any money due to the Tenderer a sum equivalent to the cost of amending such work and in the event of the amount retained being insufficient, recover that balance from the Tenderer from the amount retained under General Rules and instruction Special Instruction Clause 5 together with any expenses the Indian Bank may have incurred in connection therewith.

35. Concealed Work

The Tenderer shall give due notice in writing to the Indian Bank/ Architects / Structural Consultant whenever any work is to be buried in floor / earth, concrete, ceilings or in the bodies of walls or otherwise becoming inaccessible later on, in order that the work may be inspected and correct dimensions taken before such burial, in default whereof the same shall, at the opinion of the Indian Bank/ Architects / Structural Consultant be either opened up for measurement at the Tenderer's expense or no payment may be made for such materials. Should any dispute or differences arise after the execution of any work as to measurements etc., or other matters which cannot be conveniently tested or checked, the notes of the Indian Bank/ Architects / Structural Consultant shall be accepted as correct and binding on the Tenderer.

36. Escalation

The rate quoted shall be firm throughout the tenure of the contract (including extension of time, if any, granted) and will not be subject to any fluctuation due to increase in cost of materials, labour, sales tax, octroi, etc. unless specifically provided in these documents.

37. Idle Labour

Whatever the reasons may be no claim for idle labour, additional establishment cost of hire and labour charges of tools and plants would be entertained under any circumstances.

38. Suspension

If the Tenderer except on account of any legal restraint upon the Indian Bank

preventing the continuance of the work or in the opinion of the Indian Bank shall neglect or fail to proceed with due diligence in the performance of his part of the contract or if he shall more than once make default, the Indian Bank shall have the power to give notice in writing to the Tenderer requiring the work to be proceeded within a reasonable manner and with reasonable dispatch, such notice purport to be a notice under this clause.

After such notice shall have been given the Tenderer shall not be at liberty to remove from the site of the works or from any ground contiguous thereto any plant or materials to subsist from the date of such notice being given until the notice shall have been complied with. If the Tenderer fails to start the work within seven days after such notice has been given to proceed with the works as therein prescribed, the Indian Bank may proceed as provided in clause 39 (Termination of Contract by Indian Bank).

39. Termination of Contract by Indian Bank

If the Tenderer being a company go into liquidation whether voluntary or compulsory or being a firm shall be dissolved or being an individual shall be adjudicated insolvent or shall make an assignment or a composition for the benefit of the greater Para, in number of amount of his creditors or shall enter into a Deed or arrangement with his creditors, or if the Official Assignee in insolvency, or the Receiver of the Tenderer in insolvency, shall repudiate the contract, or if a Receiver of the Tenderer's firm appointed by the court shall be unable, within fourteen days after notice to him requiring him to do so, to show to the reasonable satisfaction of the Indian Bank that he is able to carry out and fulfill the contract, and if so required by the Indian Bank to give reasonable security therefore. or if the Tenderer shall suffer execution to be issued, or shall suffer any payment under this contract to be attached by or on behalf of and of the creditors of the Tenderer, or shall assign, charge or encumber this contract or any payments due or which may become due to the Tenderer, there under, or shall neglect or fail to observe and perform all or any of the acts matters of things by this contract, to be observed and performed by the Tenderer within three clear days after the notice shall have been given to the Tenderer in manner hereinafter mentioned requiring the Tenderer to observe or perform the same or shall use improper materials or workmanship in carrying on the works, or shall in the opinion of the Indian Bank not exercise such due diligence and make such due progress as would enable the work to be completed within due time agreed upon, and shall fail to proceed to the satisfaction of the Indian Bank after three clear days notice requiring the Tenderer so to do shall have been given to the Tenderer as hereinafter mentioned, or shall abandon the contract, then and in any of the said cases, the Indian bank may notwithstanding previous waiver determine the contract by a notice in writing to the effect as hereinafter mentioned, but without thereby effecting the powers of the Indian Bank of the obligations and liabilities of the Tenderer the whole on

which shall continue in force as fully as if the Contract, had not been so determined and as if the works subsequently executed had been executed by or on behalf of the Tenderer (without thereby creating any trust in favour of the Tenderer) further the Indian Bank or his agent, or servants, may enter upon and take possession of the work and all plants, tools, scaffolding, sheds, machinery , steam and other power, utensils and materials lying upon premises or the adjoining lands or roads and sell the same as his own property or may employ the same by means of his own servants and workmen in carrying on and completing the works or by employing any other Tenderers or other persons or person to complete the works, and the Tenderer shall not in any way interrupt or do any act, matter of thing to prevent or hinder such other Tenderers or other persons or person employed from completing and finishing or using the materials and plants for the works when the works shall be completed, or as soon thereafter as conveniently may be, the Indian Bank shall give notice in writing to the Tenderer to remove his surplus materials and plants and should the Tenderer fail to do so within a period of 14 days after receipt by him the Indian Bank may sell the same by Public Auction and shall give credit to the Tenderer for the amount so realized. Any expenses or losses incurred by the Indian Bank in get the works carried out by other Tenderers shall be adjusted against the amount payable to the Tenderer by way of selling his tools and plants or due on account of work carried out by the Tenderer prior to engaging other Tenderers or against the Security Deposit.

40. Arbitration

All disputes or differences of any kind whatsoever which shall at any time arise between the parties hereto touching or concerning the works or the execution or maintenance thereof of this contract or the rights touching or concerning the works or the execution of maintenance thereof of this contract or the construction remaining operation or effect thereof or to the rights or liabilities of the parties or arising out of or in relation thereto whether during or after determination foreclosure or breach of the contract (other than those in respect of which the decision of any person is by the contract expressed to be final and binding) shall after written notice by either party to the contract to the other of them and to the Indian Bank hereinafter mentioned be referred for adjudication to a sole Arbitrator to be appointed as hereinafter provided.

For the purpose of appointing the sole Arbitrator referred to above, the Indian Bank will send within thirty days of receipt of the notice, to the Tenderer a panel of three names of persons who shall be presently unconnected with the organization for which the work is executed.

The Tenderer shall on receipt of the names as aforesaid, select anyone of the persons name to be appointed as a sole Arbitrator and communicate his name to the Indian Bank within thirty days of receipt of the names. The Indian Bank shall there

upon without any delay appoint the said person as the Sole Arbitrator. If the Tenderer fails to communicate such selection as provided above within the period specified, the competent Authority shall make the selection and appoint the selected person as the Sole Arbitrator.

If the Indian Bank fails to send to the Tenderer the panel of three names as foresaid within the period specified, the Tenderer shall send to the Indian Bank a panel of three names of persons who shall all be unconnected with either party. The Indian Bank shall on receipt of the named as aforesaid select anyone of the persons names and appoint him as the Sole Arbitrator. If the Indian Bank fails to select the person and appoint him as the Sole Arbitrator within 30 days of receipt of the panel and inform the Tenderer accordingly, the Tenderer shall be entitled to appoint one of the persons from the panel as the Sole Arbitrator and communicate his name to the Indian Bank.

If the Arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever another Sole Arbitrator shall be appointed as aforesaid.

The work under the Contract shall, however, continue during the, arbitration proceedings and no payment due or payable to the Tenderer shall be withheld on account of such proceedings.

The Arbitrator shall be deemed to have entered on the reference on the date he issued notice to both the parties fixing the date of the first hearing.

The Arbitrator may from time to time, with the consent of the parties, extend the time for making and publishing the award.

The Arbitrator shall give a separate award in respect of each dispute or difference referred to him. The Arbitrator shall decide each dispute, in accordance with the terms of the contract and give a reasoned award. The venue of arbitration shall be in Mumbai only as may be fixed by the Arbitrator in his sole discretion.

The fees, if any, of the Arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award including the fees, if any, of the Arbitrator who may direct to and by whom and in what manner, such costs or any part thereof shall be paid and may fix or settle and amount of costs to be so paid. The award of the Arbitrator shall be final and binding on both the parties. Subject to aforesaid the provisions of the "Arbitration and Reconciliation Act 1996" or any statutory modification or re-enactment thereof and the rules made there under, and for the time being in force, shall apply to the arbitration proceeding under this clause.

The Indian Bank and the Tenderer hereby also agree that arbitration under clause shall be a condition precedent to any right to action under the contract with regard

to the matters hereby expressly agreed to be so referred to arbitration.

Submitting to Arbitration may be considered as an additional remedy and it does not preclide the parties to seek redress/other legal course.

41. Integrity Pact

This Contract will fall under the ambit of "Integrity Pact", as per Bank's/ CVC norms. Integrity pact envisages an agreement between the prospective vendors/bidders and the buyer, committing the persons/officials of both the sides, not to resort to any corrupt practices in any aspect/stage of the contract. Only those vendors/bidders who commit themselves to such a pact with the buyer, would be considered competent to participate in the bidding process. In other words, entering into this Pact would be a preliminary qualification.

The essential ingredients of the Pact include:

- Promise on the part of the Principal (Bank) not to seek or accept any benefit, which is not legally available.
- Principal to treat all bidders with equity and reason.
- Promise on the part of the bidders not to offer any benefit to the employees of the Principal not available legally.
- Bidders not to enter into any undisclosed agreement or understanding with other bidders with respect to prices, specifications, certification, subsidiary contracts etc.
- Bidders not to pass any information provided by Principal as part of business relationship to others and not to commit any offence under Prevention of Corruption/ Indian Penal Code Act.
- Foreign bidders to disclose the name and address of agents and representatives in India and Indian Bidders to disclose their foreign principals.
- Bidders to disclose the payments to be made by them to agents / brokers or any other intermediary.
- Bidders to disclose any transgressions with any other company that may impinge on the anti corruption principle.

Integrity Pact, in respect of a particular contract, shall be operative from the date of Integrity Pact is signed by both the parties till the final completion of the contract. Any violation of the same would entail disqualification of the bidders and exclusion from the future business dealings.

The Details of the Independent External Monitor (IEM) empaneled with the Bank, is as follows:

Shri Brahm Dutt, IAS (Retd) Dutt.brahm@gmail.com	Shri Balaraj Joshi balrajjoshi@hotmail.com

42. The contractor shall not assign the contract. He shall not sub-let any portion of the contract except with the written consent of the Bank. In case of breach of these conditions, the Bank may serve a notice in writing on the contractor rescinding the contractor whereupon the Security Deposit shall stand forfeited to the Bank, without prejudice to his other remedies against the contractor. Central Govt./ State Govt. organization will not be allowed to sublet the work on back to back basis.

The contractor shall carry out of all the work strictly in accordance with Drawings, details and instructions of the Architects / Structural Consultant , Consultant and the Bank. If in the opinion of the Architects / Structural Consultant , consultant or the Employer, changes have to be made in the design and with the prior approval in writing of the Employer, they desire the contractor to carry out the same, the contractors shall carry out the same without any extra charge. The Bank's decision in such cases shall be final and shall not be open to arbitration.

43) A Schedule of probable quantities in respect of each work and specifications accompany these special conditions. The Schedule of probable quantities is liable to alteration by omission, deductions or additions at the discretion of the Architects / Structural Consultant / Bank. No claim will be entertained from the contractor on account of loss of profit over revising the tender rates.

44) The Tenderer must obtain for himself on his own responsibility and at his own expenses all the information which may be necessary for the purpose of filling of Tender and for entering into a contract and must examine the drawings and must inspect the site of the work and acquaint himself with all local conditions, means of access to the work, nature of the work and all matters pertaining thereto. No compensation will be paid on account of not getting proper information.

45) The rates quoted in the Tender shall be inclusive of all charges for clearing of site before commencement as well as after completion, water, electrical consumption, meters, double scaffolding, centering, boxing, staging, planking, timbering and pumping out water, including bailing, fencing, planking, timbering and pumping out water, including bailing, fencing, hoarding, plant and equipment, storage sheds, watching and lighting by night as well as day, including Sundays and Holidays, temporary plumbing and electric supply, protection of the public and safety of adjacent roads, streets, cellars, vaults, open pavements, walls, houses, buildings and all other erections, matters or things and the contractor shall take down and remove any or all such centering, scaffolding, staging, planking, timbering, strutting, shoring, etc. as occasion shall require or when ordered so to do, and fully reinstate and make good all

matters and things disturbed during the execution of the work and to the satisfaction of the Bank / Consultant.

46) Time allowed for carrying out the work as mentioned in the Memorandum shall be strictly observed by the contractor and its shall be reckoned from the 15 days after acceptance of order to commence the work or the date of handing over the site to the contractor whichever is later. The work shall throughout the stipulated period of the contract be proceeded with all due diligence and if the contractor fails to complete the work within the specified period i.e. 9 months, he shall be liable to pay compensation as defined in the conditions of contract.

47) The contractor shall not be entitled to any compensation for any loss suffered by him on account of delays in commencing or executing the work, whatever the case of delays may be, including delays arising out of modifications to the work entrusted to him or in any subcontract connected therewith or delays in awarding contracts for other trades if the project or in commencement or completion of such works or in procuring government controlled or other building materials or in obtaining water and power connections for construction purposes or for the other reasons whatsoever and the Employer shall not be liable for any claim in respect thereof. The Employer does not accept liability for any sum besides the Tender amount, subject to such variations as are provided for herein.

48) The successful Tenderer is bound to carry out any items of work necessary for the completion of the job even though such items are not included in the quantities and rates. Schedule of instructions in respect of such additional items and their quantities will be issued in writing by the Architects / Structural Consultant / consultant with the prior consent in writing of the Bank.

49) The successful Tenderer must co-operate with the other contractors appointed by the Employer so that the work shall proceed smoothly with the least possible delay and to the satisfaction of the Architects / Structural Consultant / Structural Consultant / Consultant.

50) The contractor must bear in mind that all the work shall be carried out strictly in accordance with the specifications made by the Architects / Structural Consultant / Consultant and also in compliance of the requirements of the Authorities concerned and no deviation on any account will be permitted.

51) (i) The rates quoted in the Schedule rates also include the expenditure for providing all the water required for the work and the contractor shall make his own arrangements for the supply of good quality water including obtaining Municipal connection for his labour as well as for construction purpose and all charges shall be borne by him. If Municipal water connection is not available and should it become necessary for the contractor to drill a bore well for obtaining water for construction purposes or to bring

water from outside by Tankers, The Bank shall not be liable to pay any charges in connection therewith.

(ii) The rates quoted in the Tender shall also include Electric consumption charges for Power. If no power is available at site, the contractor shall have to make his own arrangement to obtain electric power connection and maintain at his own cost an efficient service of electric light and power and shall pay for the electricity consumed.

(iii) For water and power, the contractor to whom the work is allotted shall maintain the same in good working conditions.

(iv)Contractor for other trades appointed by the Bank shall also be allowed to use water and power available by fixing reasonable charges mutually agreed.

(v) Any dispute regarding payment for water and power charges by the other contractor and or by subsidiary agencies appointed by the Bank to the contractor, who has obtained the temporary connections and allowed sub–connections, will be settled by the Bank / Consultant and the decision taken by the Bank / Consultant shall be final and shall be that of the contractor.

(vi) The Bank as well as the Consultant shall give all possible assistance to the Contractor to obtain the requisite permission from the various authorities, but the responsibility for obtaining the same shall be that of the contractor.

(vii) If no such facility is available at the site of work and if available found inadequate, it shall be the responsibility of the contractor to make his own arrangement for obtaining water and power at his cost.

52) The contractor will have to obtain completion / clearance certificate in respect of services such as water supply, sewerage, etc. The contractor will also obtain permanent water connection for the entire project. The Bank will pay necessary fee to be made to Govt. authorities.

53) The Contractor shall strictly comply with provision of safety code annexed hereto .Contractors are not allowed to remove materials brought at Site against which advances have been paid.

54) The Contractor is to provide at all times during the progress of the works and the maintenance period / defect liability period proper means of access, with ladders, gangways, etc., and the necessary attendance to move and adopt as directed for the inspection or measurement of the works by the Consultant or their representatives.

55) Materials shall be of approved quality and the best of their kind available and shall generally conform to I.S. Specifications. The Contractor shall order all the materials required for the execution of work as early as necessary and ensure that such materials

are on site well ahead or requirement for use in the work. The work involved calls for approved standard of workmanship combined with speed and to the entire satisfaction of the Architects / Structural Consultant / consultant. All the material shall be approved by the Consultant / Bank before use. Contractor to arrange samples well in time.

56) The Contractors shall after completion of the work clear the Site of all debris and left over materials at his own expenses to the entire satisfaction of the Bank / Consultant and Municipal or other public authorities.

57) The contractor herewith agrees that in respect of inspection of works by the Chief Technical Examiner of the works, a wing of Central Vigilance Commission and the bills of the contractor including all supporting vouchers, abstract etc. to be made after payment of the bills and if as a result of such audit and technical examination any sum is found to have been over paid in respect of any work done by the contractor under the contract of any work claimed by him to have been done by him under the contract and found not to have been executed or any work is found not to have been executed in accordance with the contract, the contractor shall be liable to refund the amount of over payment made already and it shall be lawful for the Bank to recover the same from him in any manner the Bank deems fit either from any payments due and / or becoming due to the contractor or from the security deposit or retention money or through any further bills and / or final bill or in any other manner whatsoever not excluding through recourse to legal action. The certification of bills / measurements by consultant / Architects / Structural Consultant and Engineer will be scrutinized by the Bank's Zonal Office / Audit / Vigilance and any deficiency will be corrected accordingly. Contractor cannot insist for payment just because it is signed by consultant / Architects / Structural Consultant / engineer. The contractor herewith agrees to co-operate with the Bank / Consultant while such examinations of works and redo the things without any extra cost to the Bank. It is essential and agreed condition of the contract that any such action taken by the Bank shall deemed to be the fully legal and valid and binding on the contractor.

58) Contractors are requested to note that no extra item or deviated item of work to be executed without taking prior permission, the Bank shall not be held responsible for the payment of such works executed. Contractors will have to submit all the particulars including purchase bills/price list for the materials along with the rate analysis for verification of Item Rates.

59) If it is observed the existing compound wall, gates railings are damaged then the contractors will have to make good the same at their own cost.

60) If contractors fail to pay the taxes/royalties to the Authorities concerned, the Bank reserve their rights to recover the said amount from the amount payable to the contractor and pay the same to the Authorities concerned.

61) Work is to be executed & measurements are to be paid as per the detail specification & description of item given in the Standard Specification Book except for the items which are specifically mentioned in the tender for which the details of item and mode of measurements to be followed as indicated separately in the conditions of contractors.

62) If there are any contracting clauses mentioned in the tender, the interpretation of the same will be done by the Architects / Structural Consultant / consultant. However, the decision of the Bank will be final and binding.

63) The Bidder and their workman/ laborer has to follow all the protocols, instructions, directions received from Bank, Municipal Authority, State Government, Central Government etc issued from time to time for the COVID-19 at their own cost.

Copy of the Agreement to be executed is enclosed.

SAFETY CODE AND MODEL RULES FOR PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS

Safety Measures

All people working shall be provided with safety helmets, safety shoes, goggles, gloves, Safety belts etc., which shall be worn by the workmen while performing work and people working at elevation more than 10 feet shall be always provided with safety belts at contractor's cost. The safety belts shall be properly fixed to a lifeline always while at work. The Contractor shall provide safe means of access to any working place including provisions of suitable and sufficient scaffolding at various stages during all operations of the work for the safety of his workmen. Contractor shall ensure deployment of appropriate equipment and appliances for adequate safety and health of the workmen and protection of surrounding areas.

The Contractor shall ensure that all their staff and workers including their sub-contractor (s) shall wear Safety Helmet and Safety Shoes. Contractor shall also ensure use of safety belt, Protective goggles, gloves etc. by the personnel as per job requirements.

Contractor shall ensure that a proper Safety Net System and shall be used at appropriate locations. The safety net shall be located not more than feet (9.0 meters) below the working surface at site to arrest or to reduce the consequences of a possible fall of persons working at different heights.

Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public.

Personal Safety Equipments:

All necessary personal safety equipment as considered adequate by the Engineer should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the Tenderer should take adequate steps to ensure proper use of equipment by those concerned.

a) Workers employed on mixing asphalt materials, cement and lime mortars shall be provided with protective footwear and protective goggles.

b) Those engaged in white washing and mixing or stacking of cement bags or any material that is injurious to the eyes shall be provided with protective goggles.

c) Those engaged in welding works shallbe provided with welder's protective eyesight lids.

d) The Tenderer shall not employ men below the age of 18 years and women on the work of painting with products containing lead or any toxic material in any form.

Wherevermen above the age of 18 are employed on the work of precautions should be taken:

Overalls shall be supplied by the Tenderer to the workers and adequate facilities shall be provided to enable the working painters to wash during the cessation of work.

When the work is done near any public where there is risk of necessary equipments should be provided and kept ready for use and all necessary steps take for prompt rescue of any person in danger and adequate provision should be made for prompt first aid treatment of all injuries 1ikely to be sustained during the course of the work.

First Aid

At every work place, there shall be maintained in readily accessible place, first aid appliance including an adequate supply of sterilized dressings and sterilized cotton wool. The appliance shall be kept in good order and in large work place, they shall be placed under the charge of a responsible person who shall be readily available during working hours.

Electricity & Water

Construction water shall not be provided by Bank the tenderder has to make his own arrangements. The tenderder has to make his own arrangements for electrical power to carry out the work, in view of the Power restrictions imposed by Service Provider.

Before starting the work the contractor has to submit the Scaffolding drawings and it is to be approved by the Architects / Structural Consultant /Client.

The Contractor is directly responsible for any accident, injury disableness and other such things that may happen to his workmen during working hours or outside working hours if they happen to be in the work site and that he will pay adequate compensation to such people. And the contractor has to take the full responsibility for these disabilities.

The Contractor will be responsible for any accident or unto ward incident that may happen to any person in the work site or near about due to inadequate safely measures, carelessness, negligence, incorrect procedures, inadequate supervision, improper methods, and that he will attend to all related police enquiry, court attendance and will bear the cost for all such expenses including compensation, if any, to be paid.

ARTICLES OF  **AGREEMENT**

THIS AGREEMENT is made on this …… day of ……month of …….. between Indian Bank a body corporate constituted under the Banking Companies (Acquisition and Transfer of Undertakings) Act 1970, having its Zonal Office Mumbai South at 2nd Floor, 37, Mumbai Samachar Marg, Fort, Mumbai 400 023. (hereinafter referred to as the "Employer") which expression shall include its successor, legal heirs and assignees of the one part.

AND M/s. …….. having its office at ……

……

(hereinafter referred to as the "Contractor") which expression shall include its successor, legal heirs and assignees of the second part.

WHEREAS the Employer has caused drawings and tender documents for STRUCTURAL REPAIR & REHABILITATION, PAINTING ETC OF INDIAN BANK QUARTERS KARTHIK BUILDING, JAYAPRAKASH ROAD, LOKHANDWALA COMPLEX, ANDHERI WEST, MUMBAI-400102.

'**AND** whereas the Employer has called for tender vide ref. no. ……..……..…… dated……...…

AND whereas the contractor has submitted the tender ref. no. ……. dated …… to the Employer on …… .

AND whereas the Employer has issued the work order ref ……. dated…….. to the contractor to do the work.

AND whereas the Contractor has agreed to execute the work as per drawings, specifications, conditions of contract and Work Order.

AND whereas the Employer has accepted the Contractor's tender as aforesaid and whereas the tender submitted by the contractor has been accepted for such sum as may be ascertained to be payable in terms of the Bill of Quantities and which sum is estimated to be Rs. …….. (Rupees ……..……..) hereinafter referred to as the said "Contract Agreement".

NOW THIS 

AGREEMENT WITNESSETH AS FOLLOWS:-

1) In consideration of the said Contract Sum to be paid at the times and in the manner set forth in the said Conditions the Contractor shall carry out and complete the Repair & Painting Works in terms and conditions herein contained and according to the general conditions of the contract, notice inviting tender, special conditions of contract, general scope of work, technical specifications, schedule of rates and instructions to be given by and the supervision of and to the entire satisfaction of the Employer.

2) **Contract Price, Taxes and Payment Terms :**
Total contract price is Rs. ……. which is inclusive of cost of materials, equipment, installation charges and tools and tackles required for execution of the job. Above price is exclusive of all taxes (GST) in respect of this contract.

Interim payment will be made as per the site measurements on Item Rate basis.

3) **Completion Period**:

Time is the essence of the Contract. The work is to be completed in all respects within **9 Months' time** reckoned from 15th day from the date of issue of the Work Order or handing over of site whichever is later. If the Contractor fails to complete the job within the agreed time period the Contractor will have to bear liquidated damages as per the relevant clause mentioned in the Tender Documents.

4) **Earnest Money**:

The Contractor has deposited an amount of Rs. 2,67,000/- (Rs. Two Lakh Sixty Seven Thousand only) as earnest money.

5) **Inspection of Site**:

The Contractor has inspected the site before submitting his tender and has satisfied himself as to the nature of the work to be executed on the site. Any difficulties which the Contractor may come across in the course of the work shall in no way relieve the contractor to claim or receive extra payment unless the Employer is of the opinion that such difficulties could not have been foreseen and the Employer consents in writing.

6) **Supply of Material and Labour**:

The Contractor shall arrange all labour, materials, equipment, tools, tackles and everything necessary for the completion of the work. The Contractor will assume all responsibility for the safety, protection and accounting of all material and equipment and the work during construction.

All materials used by the Contractor shall be of the best quality conforming to the required specification mentioned in the tender document and will be subject to the approval of the Employer. All such materials not approved by the Employer shall be removed at once by the Contractor at his own expense. The Contractor shall also at his own expense arrange for carrying out any test of materials which the Employer may from time to time require or if so desired by the employer.

7) **Defective Work / Materials**:

If any part of the work done by the Contractor is found defective in workmanship or if bad or inferior materials have been used the Contractor shall at his own risk and cost demolish all such defective work and rebuild the same and / or replace the bad or inferior materials used within a time frame mentioned to the satisfaction of the Employer. The decision of the Employer in this regard shall be final and binding on the Contractor. In case of default of the contractor to remove the defective work and rebuild the same or replace bad or inferior materials as directed by the Employer, the Employer shall be entitled to employ anyone else to carry out the same at risk and cost of the Contractor and recover all expenses incurred in this regard from the contractor.

8) **Inspection of Work**:

During progress of the work the Employer shall be entitled at all times to have access to and inspect the work.

9) **Supervision**:

The Contractor shall provide one or more competent and technical qualified engineers duly and fully authorized to act on his behalf in all matters relating to the works to be carried out under or any other matter concerning this agreement and who shall at all times be present at the works while any work is in progress as per directions, explanations & instructions of Employer.

10) **Compliance with Statutory Regulations & Work Rules**:

The Contractor shall be responsible for complying with the applicable laws / bye laws / Regulations in force from time to time and shall have to bear all statuary liabilities to the workers / personnel engaged for the job. Nothing will be paid extra in this regard. If any amount is paid by the Employer with this regard the same amount shall be deducted from the Contractor's dues. The Contractor shall have to arrange insurance cover for the workers / personnel engaged by him for the job.

11) **Determination**  **of Contract**:

In the event of Contractor failing to keep / adhere to agreed schedule of work, or in the event of the Contractor failing to comply with the provisions of this contract by default and / or negligence and / or suspension of work or in the event of Contractor failing to complete the work within the stipulated period, the Employer may terminate this Agreement forthwith and employ, at the Contractor's risk and cost, another contractor or sufficient number of workmen to complete the work.

12) **Force Majeure**:

This clause will be operative only if the work is delayed by

a) Acts of God
b) Earthquake or floods or similar natural calamities.
c) Serious loss or damage by fire or lightning.

In case any Force Majeure condition herein mentioned occurs and continues for a period exceeding 15 days the parties hereto undertake to sit together and devise ways for expeditious and proper performance of the obligations of the parties under this order.

13) **Arbitration**:

" In the event of any dispute or difference relating to interpretation and application of provisions of the contract and all disputes/claims whatsoever which shall either during the continuance of the contract or afterwards either between the parties to the contract or the respective representatives touching the construction/application of any provision/clause mentioned in the contract or any account or liability between the parties to the contract or as to any act or deed or omission of any party to the contract, in any way relating to these presents, shall be first at the discretion of the Bank attempted to be resolved in good faith by mutual discussion within 30 days of the dispute or question being raised failing which the same shall be settled by arbitration in accordance with provisions of Indian arbitration and Conciliation act 1996.

The Parties concerned shall designate an arbitrator on mutual consent/consensus. In the event of no consensus being arrived, an Arbitral Tribunal shall be constituted comprising three Arbitrators, each party appointed one arbitrator and a third arbitrator to be appointed by the two arbitrators so appointed by the parties. The venue of the arbitration shall be exclusively at Mumbai and any award passed by arbitrator or the arbitral Tribunal shall be final, conclusive and binding upon the parties and shall be deemed to have been made between parties themselves. The parties to the dispute shall share equally the cost of arbitration as intimated by the arbitrator".

Indian Bank reserves to itself the right of altering the drawings and nature of the work by adding to or omitting any items of work or having portions of the same carried out without prejudice to this contract.

IN WITNESS whereof the said contracting parties have set their hands and seals on the day and year first hereinabove witness.

Witness Address	Employer
Witness Address	Contractor

CONDITIONS OF CONTRACT:

1. DEFINATION ANDINTERPRETATION

1.1. DEFINITIONS: In this contract following words and expressions shall have the meanings hereby assigned to them except where the context otherwise requires.

A) "Owner"/"Company" means '**INDIAN BANK**.' having its **Zonal Office Mumbai South, 2nd Floor, 37, Mumbai Samachar Marg, Fort, Mumbai 400 023.**

B) "Consultant" means **M/S ADVICE CONSULTANTS** and shall include its nominees/successors or permitted assigns.

C) "Contractor" means the person, firm or company to whom the contract is awarded and includes the contractor's personnel, representatives, successors and permitted assigns. The word 'contractor "shall include 'Sub- contractor 'As well.

D) "Site" means " **Indian Bank Officers Quarters, Karthik Building, Lokhandwala Complex, Andheri (W), Mumbai-102.**

E) Bidder/Tenderer – The firm/party who shall tender quotation to the company.

F) Consultant / Owner representative means any Resident Engineer or person acting on their behalf, empowered to inspect, supervise, measure and issue certificates in respect of the work.

G) "Sub- contractor" means any person with whom with written consent of the owner, any sub-contract has been made for the execution of any portion of the works and includes the personnel, representative, successors and permitted assign of such persons, and any to whom with written consent of the owner and the contractor any part of the contract has been similarly Sublette by the Sub –Contractor.

H) "Contract" means a form of agreement between the Owner and the Contractor to execute the same as per condition and specifications set in these documents.

I) The Works means the work to be executed by the contractor under the contract and shall all duties, responsibilities and obligations to be discharged by the contractor pursuant to the Contract.

J) **Work Order/Contract** – The formal letter/notification issued to the contractor awarding the work(s) in full or in part by the company together with the applicable terms and conditions etc. as are finally and mutually agreed to between the company and contractor.

L) 'Temporary work' shall means all such work, which are required for the smooth execution and maintenance of the works, but are not part of the contracted work.

M) 'Specifications' means the Technical Specifications furnished in this document.

N) **Consultant**– The Consultant nominated and authorized by the company for the time being for the purpose of operating the contract or any work covered thereunder.

O) 'The effective Data of Contract' means the data stipulated in the Special condition of the contract.

P) 'The contractor's Equipment 'means all machinery, apparatus and equipment's to be provided by the contractor following the contract in order to carry out obligations under the contract.

Q) **Accepting Authority** - Authorized person of INDIAN BANK.

1.2. INTERPRETATION:

A) Approval given by the owner shall relate only to the specific purpose for which it was given.

B) Approval, consent, checking, assistance, inspection or test given or made by the owner shall not relieve the contractor from any obligations under the contract.

C) No approval or consent required by the contractor shall be unreasonably with Held

D) The terms of the contract shall be varied only in written by authorized representative of the parties and shall not be effective by any oral statement.

E) Decisions to be made by the consultant and for matters, affecting works on the site shall be communicated by the consultant / owners representative.

F) Words implying singular only also include plural and vice versa where the context requires.

2. CONSTRUCTION AND EXTENT OF THE CONTRACT:

2.1 CONSTRUCTION OF CONTRACT:

The contract shall be in all respect be constructed and operated as an Indian Contract and in Conformity with the Indian Law.

EXTENT OF CONTRACT:

The Contract comprises the items mentioned in tender document plus any additional items suggested to be carried out by consultant in consultation with owner as per their requirement and complete maintenance of the works and the provision of all labor, materials, constructional equipment's, temporary works and everything, whether of temporary nature required, in order complete the works in accordance with provisions of the contract

ASSIGNMENT AND / OR SUB –LETTING:

The contractor shall not assign the contract or part thereof to any other party without the written consent of the owner.

CONTRACTOR DOCUMENT:

a) Documents Mutually Explanatory:

The several documents finishing the contract are to be taken as the mutually explanatory of one another and in case of any discrepancies; the same shall be expressed and adjusted by consultant, who shall thereupon issue to the contractor instructions directing in what system the works are to be carried out.

b) Discrepancies in Tender and Contract:

There should not be any change in the Tender document once it is uploaded. If any changes in the tender conditions, will be notified by Indian Bank only after pre-bid meeting.

c) The contract shall generally consist of the following:

Articles of the agreement duly signed by the parties concerned in token of acceptance of the contract.

d) General conditions of the contract as amended / modified at the time of acceptance of tender.

Special conditions of the contract incorporating other term and conditions

Technical specifications and drawings, if any

Bill of quantities and item Rates.

2. GENERAL OBLIGATIONS OF THE CONTRACTOR:

CONTRACTOR TO ENTER INTO CONTRACT:

The contractor shall when called upon to do so by the owner, enter into contract for execution of works. The contractor and the owner shall sign all contract documents in triplicate.

PROVISION OF CONTRACTOR EQUIPMENT / MATERIAL AND OTHER OBLIGATIONS:

In consideration of payment by the owner as stipulated in the contract, the contractor shall provide his equipment to execute and complete the works in accordance with the agreed program and shall carry out all other obligations stipulated in the contract. The Works shall strictly conform to the specifications and description of items as specified elsewhere in the contract.

EXECUTION OF WORKS:

The works shall be completed with due diligence and in the manner specified in the contract and to the satisfaction of the owner / consultant. The Contractor hereby, undertakes that the works shall be ready for any stipulated completion not later than the Date of completion

ASSIGNMENT OR SUB- LETTING OF THECONTRACT:

The contractor shall not assign the contract or any part thereof or any benefit or interest therein without the written consent of the owner. Such consent, if given, shall not relieve the contractor for any liability or obligation under the contract. He shall be responsible for the acts, defaults and neglects of any such sub-contractor, his agent's servants or workman. Provided that the provision of labor on a piecework basis shall not be deemed to be subletting under this clause. When the owner has consented to the placing of sub- orders two copies of each order shall be given to the owner.

CONTRACTOR AGENTS AND THEIR FUNCTIONS:

A) The contractor shall , when he is not personally present on the site of works , invariably place and keep on site a properly, qualified agent duly authorized and empowered to act on his behalf and to receive, on his behalf, orders and instructions from the Owner/Consultant.

B) The contractor shall forthwith remove from the site and works, and not reemploy without the written permission of the Owner/ Consultant obtained in this behalf, any agent whose removal has been asked by the owner /Consultant.

ALL COMMUNICATION INWRITING:

All notices communications, references and complaints issued or made by the owner / consultant, or by the contractor, inter se concerning the works shall be in writing and no notice, communications, references or complaints not in writing shall be valid.

3.7. a. TIME OF COMPLETION:

9 (nine) months from the date of LOI, subject to any requirements in the specifications as to the completion of any portion of the works before the completion of the whole, the works shall be completed within the time stipulated in the agreed program.

3.7. b. EXTENSION OF TIME FOR COMPLETION:

Should the type of extra or additional work of any kind or other special circumstances of any kind whatsoever which may occur, be such as fairly entitle the contractor to an extension of time for the completion of works , the consultant shall determine the period of such extension subjected to Owner's / Company's approval. Under no circumstances any financial compensation by way of revision of rates/extended stay compensation or any others shall be payable.

3.7 c. **Working hours:** Contractor will be allowed to carry out repairs in the premises during 08:00 AM to 08:00 PM only

FIRM PRICE

The rates shall be remaining firm till the entire job is completed in totality. No escalation whatsoever on any account shall be payable.

LIQUIDATED DAMAGES FOR DELAY:

If the contractor will fail to complete the works within the time prescribed or within the extended time, the contractor shall be liable to pay to the owner the sum specified in the contract as Liquidated Damages for such default. The amount for liquidated damages shall be @ Rs. 5,000/- per day of delay subject to maximum of 5% of the contract value.

The owner may, without prejudice to any other mode of recovery, deduct the amount of such damages from any moneys due for payment currently or which may become due for payment in future to contractor under this contract.

OCCUPATION AND USE OF LAND:

No Land belonging to the owner shall be occupied by the contractor without permission of the owner. The contractor shall not use or be permitted to use the site for any purpose other than for executing the works.

However, the contractor is permitted to put maximum one signboard displaying, besides his firm's name, name of the work and of the consultant. The maximum size of the signboard shall be 4'*3'

SURETIES:

The contractor shall, if the tender so provides, at his own expense provide good and sufficient sureties to the owner in the sum provided in the tender for the due performances of the contract.

EXCAVATEDMATERIALS:

The contractor shall not sell, or otherwise dispose of, remove, except for the purpose of the works materials obtained from any excavation made.

DEBRIS AND SCRAP:

The contractor shall remove debris generated due to breaking or otherwise from the site and he shall dispose of the debris in such a manner that complies rules and regulations of local authorities.

All materials dismantled or removed from the existing structure shall be stacked in a proper manner and shall not be disposed of without permission of the owner. All scrap materials will be property of the owner unless scrap amount is recovered by owner through a tender item.

DAMAGES TO PERSONS AND PROPERTY:

The contractor shall indemnify and keep the owner inform for all losses and claims for injuries and damages to any person including those under his or his Sub-contractor / third party and any property whether belonging to the construction and maintenance of work. Proper insurance shall be taken & copy shall be submitted to consultant/Owner.

CONTRACTORS SUPERINTENDENCE:

The contractor shall be provide all necessary and adequate superintendence during the execution of the works. The contractor shall prepare 'Daily Reports', Progress Report' and "Activity chart" as may be required by the owner /consultant

HOUSING OF STAFF AND WORKMEN

No housing of staff and workers will be allowed in/near the premises.

HEALTH:

The contractor shall be responsible for giving all necessary notice of infectious and contagious diseases and for isolation and removal of each cases from the site

WATCHMEN AND LIGHTING:

The contractor shall in connection with works, provide and maintain at his own cast all lights. Guards, fencing and watchmen when and where necessary or required by the owner.

SAFETY:

Where work is being carried out above ground level and there is a possibility of injury to person or property in case of anything failing, adequate precaution shall be taken to prevent such injury by.

Railing off the danger area below and display of 'KEEP CLEAR 'notices;

By the provision of safety sheets adequate to catch anything that might fall.

Contractor shall enforce the use of safety appliances, if anything is to be dropped deliberately from a height then in addition to the other precautions, one man shall, during the period of the drop, be posted outside the danger area whose sole duty shall be to insure that no person enters the danger area.

FACILITY OF OTHER CONTRACTOR:

The Contractor shall afford all reasonable facilities to any other contractor employed by the Owner.

STATUTORY OBLIGATIONS, NOTICES , FEES ,CHARGES:

The contractor shall comply with and give all notices required by any authority. The contractor shall pay and indemnify the Owner against liability in respect of any fees or charges (including any taxes) legally demanded under any regulation or law of authority from him.

PATENT RIGHTS ANDROYALTIES:

The contractor shall indemnify the Owner from and against all claims and proceedings for or on account of infringement of any patent rights , design , trademarks or name or other protected rights in respect of any constructional material / machinery / equipment used for or in connection with execution of the Works.

HOUSEKEEPING:

Removal of debris in every item of work applicable will not be paid separately

3. DUTIES AND POWER OF THE CONSULTANT / OWNERS REPRESENTATIVE:

The duties of the Consultant are to watch and supervise the works and to witness tests and examine any materials to be used or the workmanship employed concerning the works. Any written instructions or approval given by the Consultant/ Owners Representative to the Contractor shall bind the Contractor.

Any failure of the Consultant / Owner's Representative to disapprove any work or material shall not prejudice the power of the Consultant/Owner's thereafter to disapprove such work or materials or to order the pulling down, removal of breaking-up thereof even at a later stage.

4. EXECUTION OFWORKS

COMMENCEMENT OFWORKS:

The contractor shall commence the works within 15 days or as stated in the contract after receiving an order in writing to this effect from the Owner.

COMPLIANCE WITH THE CONSULTANT / OWNER'SREPRESENTATIVE:

The consultant / Owner's representative shall direct the contractor in respect of the several parts of works to be executed and the contractor should execute the works from time to time in accordance with the agreed program.

ALTERATION TO THE WORKS:

The consultant / Owner's Representative shall have right to alter, add or omit from or abandonment to any part of the Works.

If any work over and above that including in the contract is required to be executed at site, the contractor shall have no right to be entrusted with the execution of such additional work but the Consultant / Owner's Representative shall have the right to appoint any other Contractor, if it is felt necessary.

MEANING AND INTENT OF SPECIFICATIONS ANDDRAWINGS:

If any dispute or doubt arises as to the meaning or intent of the Specifications and drawings or as to the execution of the Works or the quality of any material or as the measurement of the Works, the decision of the Consultant /Owner Representative shall prevail subject to the result of an appeal as provided in the contract. If either drawings or specifications contain any mention of description of minor details which are reasonable and obvious and are intended for satisfactory completion of the

Works the contractor shall provide such materials / services without any extra cost, as if the same were mentioned and shall be deemed to be included in the Contact.

PROVISION OF SHED, STORE HOUSES AND OTHER CONSTRUCTION EQUIPMENTS ATSITE:

The Owner shall provide space for sheds, storehouses and yards and / or closed garage if possible. The contractor shall at his own expense provide and maintain suitable equipment's that may be deemed necessary for skillful execution of the Works.

MATERIALS AND WORKMANSHIP:

Except where otherwise specified the contractor shall at his own cost supply and provide all necessary construction equipment's, temporary works, materials both for temporary and for permanent works, labor (including supervision thereof) transport to and from the site and in and about the Works and other things of every kind required for the construction completion and maintenance of the Works.

The Contractor shall be responsible for receiving and off-loading all equipment's, materials, tools etc. delivered to the site.

QUALITY OF MATERIALS AND WORKMANSHIP AND TESTS:

All materials and workmanship shall be of respective kinds described in the Contract and in accordance with the instructions of the Consultant / Owner's Representative and shall be subjected to such tests as the Owner may direct at the place of manufacturer or on the site or at such places where such tests are carried out . The Contractor shall provide such assistance, instruments, machines, labor and materials as area normally required for examining, measuring and testing any work and the quality of any material used and shall supply samples of materials before incorporation in the Works for testing.

The Contractor at his own cost shall supply all samples.

The cost of conducting any test shall be borne by the Contractor, if such test is clearly intended by or provided for in the Contract and is particularized in the specifications or Bill of Quantities in sufficient detail to enable the Contractor to price or allow for the same in this tender.

EXAMINATION OF WORK BEFORE COVERING UP:

No work shall be covered up or put out of view without the approval of the consultant. The contractor shall give due notice to the consultant.

REMOVAL OF IMPROPER WORK ANDMATERIALS:

The consultant /owner's representative shall during the progress of the works have power to order in writing.

Removal of any material from site, which in his opining are not in accordance with the contract.

Substitution of proper and suitable materials and Removal and proper re- execution of any work, which in respect of materials or workmanship is not in accordance with the contract.

COMPLIANCE WITH LABOUR REGULATIONS:

The contractor needs to avail labor license for this project. In respect of all persons directly or indirectly employed on the works, the contractor shall comply with the labour regulations made by the authorities as regards to payment of wages, working hours, wage cards etc. The Contractor must get himself registered for the work as per the provision of the Contract Labor Act and shall comply with the regulations of this Act and shall indemnify the owner against any loss or damages arising out of the contractor being liable under the provision of this Act in whatsoever manner. The contractor in every case shall pay all statutory dues like PF, ESIC & other dues & also pay accidental benefit to the workmen as engaged by him on this contract as per workmen compensation act.

5.9 WORKMEN'S COMPENSATION ACT/PROVIDENT FUND/EMPLOYEES/STATE INSURANCE SCHEME:

In every case by virtue of the provision of the worker's Compensation Act or other relevant Pf/ ESIC acts, the owner is obligated to pay compensation to a person employed by the Contractor in the execution of the works, the Owner will recover from the Contractor the amount of the compensation so paid and without prejudice to the rights of the owner under the said Act, The Owner shall be at liberty to recover such amount or any part thereof by deducting it from any monies due or which may become due to the Contractor, whether under this Contract or otherwise. The Contractor shall be also responsible for the observance of the provision of these Acts by the sub-contractor employed in the execution of the Contract.

5.11 SUPPLY OF ELECTRICITY AND WATER:

The Owner, at the request of the Contractor shall provide electricity on chargeable basis as may be available at a point most suitable to the Owner. The contractor shall provide all connections for utilizing the power. It will be the Contractor's responsibility to get any permission required for using power for the work. The Owner shall not supply water for the works and it shall be the contractor's responsibility to arrange for supply of water from the external sources. The contractor shall be responsible for the storage and proper use of water. It will be contractor's responsibility to comply with the notice of authorities as regards to use and storage of water.

5. MAINTENANCE AND DEFECTSLIABILITY:
PERIOD OFMAINTENANCE:

If it shall appear to the owner /consultant's Representative , at any time during the progress of the works or at any time prior to the expiration of the period of maintenance of such work, that any work has been executed with unsound , imperfect or unskillful workmanship or with materials of inferior description, or that any materials provided by the Contractor for the execution of the work are unsound or of inferior quality to that contracted for, the Contractor shall pull down take up, or take out the works so complained .The Contractor shall rectify any defects caused or done due to the use of inferior material or workmanship at his own cost.

If the contractor replaces or renews any portion of the work, the provision of this article shall apply to the portion of the Works so replaced or renewed until the expiration of 24 months from date of such replacement or renewal.

6. MEASUREMENT OFWORKS:

QUANTITIES IN BILL OFMATERIALS:

The quantities set out in the SOR are the estimated quantities of the works. Actual and correct quantities of the Works to be executed by the Contractor

METHOD OFMEASUREMENT:

Measurement of the Works shall be made according to the procedure set forth in the relevant Indian Standards or as specified in specifications. The Contractor shall prepare a, measurement book in which all measurement shall be entered as and when required but not later than 7 days along with the Consultant /Owner's representative on this book weekly during execution.

CERTIFICATES ANDPAYMENTS:

PAYMENTS: The Contractor shall be paid for the work at the rates specified in the accepted schedule of rates and for work determined on the basis of the actual measurements of such work taken by the Consultant / Owner's Representative in accordance with the rules prescribed.
Payment shall be made electronically within 30 days of submission of monthly invoices together with electronically all supporting documents. Retention money / security deposit will be deducted while payment. Mobilization advance shall not be paid.

BASIS OF PAYMENT:

The contractor shall be paid on the basis of the actual work done at site and measurement taken by the Consultant and such measurement shall be taken from time to time and properly recorded for the progress of the work.

CERTIFICATE OF COMPLETION:

As and when the consultant receive a written request from the Contractor about completion of any rectification of faulty/affected work during the period of maintenance, the consultant should issue a Certificate of Completion in respect of the Works that are satisfactorily completed by contractor by attending the same as directed by consultant.

MAINTENANCE CERTIFICATE:

The contract shall not be deemed to be duly completed until a Maintenance Certificate shall have been issued by the Consultant recording that the Works have been completed and maintained to his satisfaction. The Maintenance Certificate shall be issued by the Consultant upon the Expiration of the period of maintenance, or as soon thereafter as any work ordered during such period of maintenance, shall have been completed to the satisfaction of the consultant.

ADJUSTMENT OF FINAL ACCOUNT:

On the issue of the Certificate of Completion by the consultant in respect of work, an adjustment of the accounts shall be made against deductions, if any and the balance of the accounts, based on the Consultant / Owner's Representative certified measurements of the total quantity of the work executed by the contractor up to the date of completion and as per the accepted schedule of rates, for any extra work on rates determined , shall be paid to the contractor , subject to any deductions which may be under these conditions , and further subject to the Contractor having delivered to the Consultant / Owner's Representative either a full account in detail of all claims, he may have on the Owner in respect of the works, or a 'NO Claim' certificate. Consultant / Owner's Representative having granted to the Contractor a certificate in writing, after receipt of such accounts that such claims are correct , that works have been completed , they have been inspected by the Consultant /Owner's Representative since their completion and found to be in good order in all the properties , works and things removed , disturbed or injured in consequences of the works, have been properly replaced, any damages or loss by any from or in consequences of, the works have been satisfied , agreeably and in Conformity with the contract .The Retention Money shall become due and shall be paid to the contractor after the expiration of the period of maintenance, or Defects Liability Period.

8. INSURANCE & LABOUR LAWS

The contractor shall take adequate insurance cover against damage to property including his equipment's, materials and injury to any personnel/ third party and shall provide due evidence of such cover when asked by the Owner. The Contractor shall solely liable for any cost, claims, expenses caused due to loss or damage of any nature arising out of or in connection with the execution of the Works not covered under any policies, the Owner might have not taken , and shall have indemnify the Owner in respect of such claims, costs , expenses.

9.1 THIRD PARTY LIABILITY:

1. The Contractor shall take third Party Liability Insurance of such limits as specified in the

Special conditions of the Contract and indemnify the Owner against such Third Party Liabilities.

2. The Contractor shall also be responsible for any other statutory requirements in regard to personnel in the Contractor's employment.

9-2 LABOUR LAWS

Contractor shall be fully comply with all labor laws applicable in the state including minimum wages act, workmen compensation act, P F & E S I act, etc.

10. FORCE MAJEURE:

'Force Majeure' shall mean any circumstances beyond the reasonable control to a party, which prevent or impede the performance of the Contract including, but not limited to, the matters listed below.

- War or hostility.
- Riot or civil commotion.
- Earthquake, flood, tempest, lighting or other natural disaster.
- Accident fire or explosion on the site not caused by the negligence of the contractor,
- Law or order of any Government or Govt. department which impedes or delays the Work.
- Denial of the use of any Railway, Port, Airport, Shipping services and other means of public transport.

A mere shortage of labor, materials or utilities shall not constitute 'Force Majeure 'unless caused by circumstances, which are themselves Force Majeure. If the either party to the contract is prevented or delayed from or in performing any of his obligations under the Contract by Force Majeure , then he shall notify the other party of the circumstances constituting Force Majeure and specify the obligation, the performance of which is thereby delayed or prevented and the party giving such notice shall thereupon be excused for the performance Notice under this provision for extra time or for delay in completion can be given within 7 days of Commencement of such circumstances.

11. CONTRACTOR'S DEFAULT:

If the Contractor shall fail or neglect to execute the works with due diligence and expedition, or shall refuse or neglect to comply with any reasonable orders given to him in writing by the Consultant /Owner's Representative in connection with the works or shall contravene the provision of the Contract, the Consultant /Owner's Representative may give notice in writing to the contractor to make good such failure, neglect or contravention. Should the Contractor fail to comply with notice within the time specified in the notice, then the Owner shall at liberty to execute such part of works as the contractor may have fail to do without prejudice to any other rights, the owner may take the works wholly or partly of the Contractor's hands & shall get it executed at contractor's risk &cost.

12. SUSPENSION OFWORK:

The Contractor shall on the written order of the Consultant /Owner suspend the progress of the works and during such suspension properly protect and secure work. In such eventuality, under no circumstances the contractor shall be compensated in way of revision of rates or otherwise.

13. TERMINATION:

RIGHT OF THE OWNER TO DETERMINE AND TERMINATECONTRACT:
The owner shall at any time, be entitled to determine and terminate the Contract, should in the Owner's opinion, the cessation of the Works become necessary owing to paucity of funds or from any other cause whatsoever, in which case the cost of approved materials at the site and of the value of the work done to date by the contractor shall be paid for in full at the rates specified in the Contract.

TERMINATION OF CONTRACT OWING TO DEFAULT OF CONTRACTOR: If the contractor shall at any time:

- Becomes bankrupt insolvent or.
- Make an arrangement with, or assignment in favor of his creditors or agree to carry out the contract under inspection of a committee of his creditors or.
- Being a company or corporation, go into liquidation or.
- Have an auction levied on his goods or property on the works or.
- Assign the Contractor or any part thereof, otherwise than as provided in the General Condition of the Contractor
- Persistently disregard the instructions of the consultant /Owner's Representative or contravene any provision of the contractor.
- Fail to remove materials from the site or pull down and replace any work after receiving from the Consultant a notice to the effect that the said materials or work have been rejected under the Contractor.
- Fail to take steps to employ competent or additional staff and labor as required.

- Fail to afford the Consultant /Owner proper facility for inspecting the works as required.

Then in any of the said cases, the Owner may determine and terminate the Contract after giving due notice and time. The Owner shall be entitled after giving due notice in writing under the hand of the consultant to remove the Contractor from, the whole or any portion of the Works thereby avoiding the contract or releasing the contractor from any of his obligations or liabilities under the contract and adopt any or several of the following courses:

a) Rescind the contract in which case the security deposit of the Contractor shall stand forfeited by the Owner, without prejudice to the owner's right to recover from the Contractor any amount by which the cost of completing the work by any other Agency, shall exceed the value of Contract.

b) Carry out the work or any part thereof by the employment of the required labour and materials and to debit the Contractor with such cost.

c) Measure up the work executed by the Contractor and to get the remaining work completed by another Contractor at the risk and expense of the contractor. In the event of any several of the courses referred above, being adopted:

The Contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials, or entered into any commitments, or made any advance on account of or with view to the execution of work. The Owner shall be entitled to take possession of any materials, tools, machinery and to retain and employ the same in further execution of the work, without the contractor being entitled to any compensation for the use and employment thereof or wear and tear or destruction thereof.

14. NOTICES:

Any notice to be given to the Contractor under the terms of the Contact, shall be served by sending the same by post to or leaving the same at the Contractor's site office or principle place of business. Any notice to be given to the Owner under the terms of the Contact shall be served by sending the same by post to or leaving the same at the Owner's address.

15. ARBITRATION:

All disputes of difference whatsoever which shall at any time arise between the parties (other than the Central PSUs) hereto touching or concerning the works or the execution or maintenance thereof this Contract or the rights touching or concerning the works or the execution or maintenance thereof this Contract or the construction meaning operation or effect thereof or to rights or liabilities of the parties or arising out of or in relation thereto whether during or after completion of the Contract or whether before or after determination, fore-closure or breach of the Contract (other than those in respect of which the decision of any person is by Contract expressed to be final and binding) shall after written notice by either party to the Contract to the other of them and to the Appointing Authority herein after mentioned be referred for adjudication and shall be settled as per the Arbitration and Conciliation Act 1996 of the Govt. of India. In respect of disputes with the Central PSUs, they shall be settled as per the Guidelines of the Govt. of India.

16. VARIATIONS:

ALTERATION, ADDITIONS, AND OMISSION:

The Consultant, in consultation with Owner, shall make any variation of the form, quality or quantity of the works or any part thereof that may in his opinion necessary and for that purpose, or if for any other reason it shall in his opinion be desirable, he shall have power to order the Contractor to do so and the Contractor shall do any of the following as agreed by owner:

- Increase or decrease the quantity of any work included in the Contract.
- Omit any such work.
- Change the character or quality or kind of any such work,
- Change level, lines, position and dimensions of any part of the works.
- Execute additional work of any kind necessary for the completion of the Works and no such variations shall in any vitiate or invalidate the Contract but the value, if any, of all such variations shall be taken into account in ascertaining the amount of the Contracts.

ORDERS FOR VARIATIONS:

No such variations shall be made by the Contractor without an order in writing by consultant with the consent of the owner.

VARIATION IN QUANTITIES AND VALUE:

As the Bill of quantities contains estimated quantities and the nature of work being of rehabilitation, no extra claim from contractor shall be entertained for any variation in quantities.

EXTRA ITEMS:

All items not included in the Bill of Quantities are called extra items, and shall not vitiate the Contract. The Contractor shall inform the Consultant the change and submit rate analysis within 15 days of written order. The Consultant shall have a right to reject any claim made by the Contractor if in the opinion of the Consultant that such claims are covered under the contract. However, acceptance/rejection of this extra items shall be entirely depends on Owner/Company.

Mere forwarding of extra items approved by consultant does not prejudice the company/owner to accept the same. The decision of acceptance/rejection if any extra item by the owner is final & binding on consultant/contractor

17. MATERIALS

17.1QUALITY

All materials for incorporations into the works shall be of the best quality of their respective kinds as specified herein and shall be obtained from sources and suppliers approved by Consultant and shall comply strictly with the tests prescribed hereinafter or, where tests are not laid down in this Specification, with the requirements of the latest edition of the relevant Indian Standards approved by the Engineer.

INSPECTION &TESTING

All materials before being incorporated into the Works shall be subjected to inspection and testing as provided in the Conditions of Contract and elsewhere in the Specifications. The cost of all samples for all tests required by this Specifications or approved Standards shall be deemed to be included in the Contract rates. No materials shall be used in the Works unless they have first been approved by the Engineer or his Representative.

SAMPLE

Samples of all materials proposed to be used or incorporated in the works and to be supplied by the Contractor may be called for at any time by the Engineer or his Representative.

INDEPENDENT TESTS

Independent tests and analysis of any of the materials may be made from time to time by a Testing House or Analyst appointed by the Engineer/ Employer in order to check the supplier's works tests and analysis. The Contractor shall at his own expenses supply and deliver to a Testing house or Analyst such materials as may be directed by the Engineer. Should the result of any test be unsatisfactory to the Engineer or his Representative, the materials represented will be rejected. The costs of all successful tests & all other costs shall be borne by the Contractor.

18. EARTHWORK IN EXCAVATION AND FILLING

GENERAL

The Contractor shall furnish all labor, material, tools equipment and necessary service to complete all excavation and backfilling in accordance with the drawings and as per

Specifications.

The scope shall include.

a) Excavation for all new foundations footings, trenches pits, drainage, etc. in all types of soil, soft or hard murum which can be removed by a pickaxe and in boulders less than015cum.size.

b) Carrying out all fill and backfill to complete sub-grades, structures, etc. All fill and backfill shall be uniformly compacted to the satisfaction of the Consultant and shall contain sufficient moisture to ensure maximum compacted density. If materials from the excavation are not sufficient for the required fill or are unsatisfactory, the Contractor shall arrange for and obtain fill material from borrow areas shown by consultant and shall be of approved quality.
During excavation the control of surface, monsoon, subsoil and/ or seepage water shall be the responsibility of the Contractor.

c) The sides of all excavations 1.2M or more in depth shall be cut to slopes as directed by the Engineer. The sides of excavations shall be shored and braced, in addition, if directed by the Consultant.

19. DISPOSAL OF EXCESS MATERIAL

The Contractor shall dispose of excess excavated/dismantled/ material/debris and unsuitable materials at dumping yard outside the premises of NICL which are Corporation approved dumping yards.

The contractor has to arrange of such authorized disposal yard in such a fashion so that, Owners/Company is not subjected to explanation and /or financial liability to any statutory authority / body on this account.

EXCAVATION FOR STRUCTURES

Excavation for structures shall be carried out to the depths shown in the drawings or as directed by the Consultant in change and to specified widths. If there are any slips in the excavation they shall be removed by the Contractor at his own cost to provide correct dimensions required for foundations. All excess excavation shall be backfilled to grade with lean concrete 1:4:8at Contractor's own cost.

BACKFILL

All backfill around footings, walls and structures shall be placed in 150mm layers and compacted at optimum moisture content. The backfilling operations shall not commence until permission has been granted by the Engineer.

CONTROL OFWATER:

The contractor shall furnish, install and operate all necessary machines, applications and equipment to keep the excavation free from water at all during construction and shall dispose of water as directed by the Engineer.

FILLING WITH MURRUM OR SELECTEDEARTH

Murom or selected earth shall be of approved quality. Only freshly quarried earth shall be used on the works and in no case shall disintegrated material be used. On the specified site Murom or selected earth shall be spread in 150mm thick layers compacted at optimum moisture content till full compaction is attained by mechanical tamping or other approved means. The finished surface shall be leveled and shall follow the gradient or levels of the base of the flooring. Following with water for consolidation will not be allowed.

FILLING WITH SAND

Sand required for filling plinths, ramps etc. Shall be clean and coarse and generally obtained from local sources unless found to be unsuitable. It shall be contain more than 10% of clay. The sand shall be filled as shown on the drawings and as directed by the Engineer. The sand shall be filled, watered and compacted in layers not exceeding 100 mm in thickness. The sand shall be compacted to the maximum density in layers with heavy hand rammer.

MEASUREMENT FOR PAYMENT

PAYMENT FOR ALL excavation shall be made for actual quantity of work done under the item limited to maximum quantity as calculated from dimensions in the drawings (with 450mm beyond the

P.C.C. pad in plan) and to the required depth. Any excavation done by the Contractor beyond this shall not be paid for and backfilling of such excess excavation shall be done by the Contractor at his own cost. Payment for Murum or sand or selected earth shall be made for the compacted dimensions actually measured or as per the drawings.

RUBBLE PACKING / SOLING

GENERAL

The Contractor shall furnish all labor, materials, tools and services to complete all rubble packing/ soling, in accordance with the drawings and as specified herein.

MATERIALS

The rubble stones shall be sound, hard and durable. They shall have at least one dimension equal to the thickness of rubble packing /soling and shall in any case, not be less than 150mm in any direction. The stone shall be carefully hand packed with the longest side of each stone placed vertical with the smaller face of two ends at the top. All interstices between stones shall be filled in solid with well driven stone chips and the surface shall be made uniform with grit. The surface shall be formed to such slopes as directed by the Engineer. The concrete for flooring shall be laid after the Engineer or his Representative inspects the rubble packing/soling laid.

MEASUREMENTS Actual dimensions in plan.

20. REINFORCED CONCRETE & ALLIEDWORKS

This specification covers the general requirements for concrete to be used in the works, on-site production facilities including the requirements regarding quality, handling, and storage of ingredients, proportioning, mixing pouring and testing of concrete. Requirements in regard to the quality, storage, bending and fixing of reinforcement are also covered.

The following specifications, standards and codes are made a part of this specifications all shall be the latest edition including all applicable revisions and additional publications. In case of discrepancy between this specifications and those referred to herein, this specification shall govern.

IS: 269 - Specification for ordinary, rapid-hardening & low heat Portland cement

IS: 455 -1989 - Specification for Portland blast furnace slag cement.

IS: 1489-1991 - Specification for Portland- Pozzolona cement (Part-1)

IS: 4031 - Methods of physical tests for hydraulic cement.

IS: 8112-1989 - Specification for 43 grade hydraulic cement

IS: 12269-1987 - Specification for 53 grade hydraulic cement

IS: 12330-1988 - Specification for sulphate resistant cement

IS: 10262- Specification for concrete mix design

IS: 650- Specification for standards sand for testing of cement: IS: 2386- Methods of tests for aggregates for concrete.(I-VIII)

IS: 516 - Methods of tests for strengthofconcrete.IS:1199
- Methods of sampling and analysis of concrete.

IS: 3025 - Methods of sampling and test physical and chemical) for water used IS: 1139 - Specifications for hot rolled mild steel and medium tensile steel

Deformed bars for concrete reinforcement.

IS: 1786 - Specifications for cold twice steel bars forconcretereinforcement.IS:4990
- Specifications for plywood for concrete shuttering work.

IS: 2645 - Specifications for integral cementwaterproofingcompounds.IS:4461
- Code worked steel bars for the reinforcement of concrete.

IS: 456 - Code of practice for plain and reinforced concrete. (Revision year 2000)IS: 3395
- Code of practice for composite construction.

IS: 2751 - Code of practice for welding of mild steel bars used for reinforcement Concrete Construction.

IS: 2502 -Code of practice for bending & fixing of bars for concrete Reinforcement.

IS: 2571 - Code of practice for laying in situ cementconcreteflooring.IS:3414 - Code of practice for design and installation of joints in buildings.

IS:3358 - Code of practice for use of immersion vibrators for consolidating Concrete.

IS: 4014 - Code of practice for steel tubular scaffolding

IS: 1791 - Specification for batch type concrete mixers.

IS: 1200 - Methods of measurement of building works.

IS: 3385 - Code of practice for measurement of civil engineering works

In the event that state or other government bodies have requirements more stringent than those set forth herein, such requirements shall be considered to be part of this specification and shall supersede this specifications where applicable.

The quality of materials and method and control of manufacture and transportation of all concrete work, whether reinforcement or not, and irrespective of mix, shall conform to the applicable portions of the specifications.

The Engineer shall have the right to inspect the material/s, the layout and operation of procurement and storage of materials, the concrete batching and mixing equipment, and the quality control system. Such an inspection shall be arranged and Engineer's approval obtained prior to starting of concrete work.

The ingredients to be used in the manufacture of standard concrete shall consist solely of a standard type of Portland cement, clean sand, natural coarse aggregates, clean water and admixtures, if specially called for on drawings or specification.

CEMENT-OPC 43 Grade as per IS-8112 & 53 Grade as per IS12269.

Unless otherwise specified cement shall be ordinary Portland cement in 50 kg bags changing of brands or type of cement within the same structure will not be permitted. A certified report attesting to the conformance of the cement to I.S specifications by the manufacturer shall be furnished to the Engineer, if required.

Cement bags shall be stored in a dry enclosed shed, well away from the outer walls and insulated from the floor to avoid contact with moisture from the ground and so arranged as to provide ready access. Damaged or reclaimed or partly set cement will not be permitted to be used and shall be removed from the site. Cement held in storage for a period of ninety days or shall be tested

CEMENT – PPC as per IS 1489 & GGBFS as per BS 6699 or Slag cement as per IS 455OR
Sulphate resistant cement as per IS 12330

For all plaster & finishing works other than structural member's new construction, Portland Pozzolona cement or granulated blast furnace slag cement shall be used to avoid shrinkage cracks in plaster during hydration & to reduce risk of alkali silica reaction as per consultant's approval. However, enhanced curing period must be observed as per standard practice & manufacturer's instructions.

WHITE CEMENT as per IS 8042:1989

White cement shall be used as a coat for protecting newly done plaster as well as primer to cement paint in single coat. The same may be used in double coat as paint itself with addition of polymer at specified dosage. Coverage shall be observed as per manufacturer specification.

AGGREGATES

All aggregates shall conform to IS: 383 (latest edition). Aggregates shall consists of natural sands, crushed stone and gravel from a known source and shall be chemically inert, strong, hard durable against weathering , of limited porosity and free from deleterious materials that may cause corrosion of the reinforcement or may impair the strength and / or durability of concrete. The grading of aggregates shall be such as to produce a dense concrete, of specified strength and consistency that will work readily into position without segregation and shall be based on the 'mix design' and preliminary tests on concrete.

All coarse and fine aggregates shall be stacked separately in stock piles near the works site in bins properly constructed to avoid inter mixing of different aggregates. Contamination with foreign materials and earth during storage and while heaping the materials shall be avoided. The aggregates must be of specified quality not only at the time of receiving at site, but more so at time of loading

into the mixer. Aggregates having a specific gravity below 2.6 shall not be used without special permission of the Consultants.

FINE AGGREGATE (SAND)

Fine aggregates shall consist of natural or crushed sand to IS: 383. The sand shall be clean, sharp, hard, strong and durable and shall be free from dust, vegetable substance, adherent coating, clay, alkali, organic matter, mica salt or other deleterious substance, which can be injurious to the setting qualities, strength and durability of concrete

Sand shall be prepared for use by such screening or washing, or both, as necessary, to remove all objectionable foreign matter while separating the sand grains to he required size fractions.

The percentage of deleterious substance in sand delivered to the mixer shall not exceed the following.

	`	Percent by Uncrushed	Weight Crushed
I	Material finer than 75 micron IS sieve	3.00	15.00
I	Shale	1.00	---------
I	Coal and lignite	1.00	1.00
I	Clay lumps	1.00	1.00
V	Total of all above substance (I to IV) for uncrushed sand and (II to Iv) for crushed sand	5.00	2.00

The apparatus required is 250ml glass measuring cylinder. (Slit contents determine by volume)

The glass cylinder is filled with salt water solution (contraction of the solution will be tea spoon full of common salt for every 570ml) up to 50 ml. Mark.

1) Add sand until the level of sand is up to 100 ml mark.
2) Add Salt water solution till 150 ml mark is reached.
3) Place the palm on the mouth of the cylinder and shake it vigorously.
4) Place the cylinder on the hard levelled surface and tap it all around so that sand is leveled.
5) Wait for 15 to 20 minutes, the silt will be collected on the top of sand.
6) Measure the height of sand & thickness of silt.
7) Calculate SILT content (%) = (thickness of silt layer) / (height of sand) multiply by 100.

TYPE OF SAND ZONE (IS 383) FINENESS MODULUS USE INCONCRETE

FINESAND	IV	2.2TO2.6	+ 1.5% FOR ZONE1
MEDIUM SAND	2&3	2.6TO2.9	- 1.5% FOR ZONE3

COARSESAND I 2.9TO3.2 - 3% FORZONE 4

SAND HAVING F.M. MORE THAN 3.2 ARE NOT RECOMMENDED FORCONCRETE.

Special sand like pozzo sand containing fly ash etc. shall be used with OPC 53 or 43 grades & shall never be mixed with PPC/ GGBFS. Sand from Gujarat shall be used with techno commercial approval from client & consultant in writing.

COARSE AGGREGATES--KHADI /KAPACHI.

Coarse aggregates i.e. where most of it is retained on the 4.75mm IS sieve, shall conform to IS: 383. This shall be natural or crushed stone and gravel, and shall be clean and free from elongated, flaky or laminated pieces, adhering coatings, clay lumps, coal residue, clinkers, slag alkali, mica, organic matter or other deleterious matter. Natural gravel and crushed rock shall be screened or washed, or both, for removal of dirt or dust coating, if so required by the Engineer.

The grading of coarse aggregates shall be within the limits specified. The maximum size of the aggregates shall be the maximum size of the number, provided that the concrete can be placed without difficulty so as to surround all reinforcement thoroughly and fill the corners of the form.

For heavily reinforced concrete members, the nominal maximum size of the aggregates shall be 5mm less than the maximum clear distance between reinforcement bars or 5mm less than the maximum cover to the reinforcement, whichever is smaller.

21. WATER.

Water used for both mixing and curing shall be free from injurious amounts of deleterious materials. Potable waters are generally satisfactory for mixing and curing concrete. Where water contains an excess of acid,alkali, sugar, oil or salt, the Engineer may refuse to permit its use. Underground / Bore well water needs to be checked before use for impurities &hardness.

22. REINFORCEMENT

A) reinforcement bars shall be either plain round mild steel bars Grade I as per Is:432 (partI)orcoldtwistedbarsasperIS:1786,orhotrolleddeformedbarsasperIS
: 1139 as shown and specified in the drawings. Wire mesh or fabric shall be in accordance with IS: 1566.

B) The reinforcement shall not be kept in direct contact with the ground but stacked on top of an arrangement of timber sleepers or the like. If the reinforcement rods have to be stored for a long duration, they shall be coated with cement wash before stacking and / or kept under cover or stored as directed by the Engineer.

C) All steel shall be of Grade I quality unless specifically permitted by the Engineer. No re-rolled material shall be accepted. If demanded by the Engineer. The contractor shall submit the

manufacturer's test certificate for the steel. Random test on the steel supplied by the contractor may be performed by the specifications as per the relevant Indian Standards. Steel not conforming to the specifications shall be rejected.

D)All bending shall be done cold to the dimensions shown on the drawings bars shall be accurately fixed by an approved means and maintained in the correct position shown on the drawings by means of spacing bars, necessary chairs and cover blocks, as per IS : 2502 to prevent displacement during placing and compaction of concrete. bars intended to be in contact at the crossing points shall be securely bound together at all such points wit number 16 G annealed, soft iron binding wire .All protruding bars from columns, beams and slabs ,to which other bars are to be supplied later, shall be protected from rusting by applying cement slurry.

E) Laps and splices shall be as shown on the drawings. Splices in adjacent bars shall be staggered and the locations of all splices, except those specified on the drawings, shall be approved by the Engineer.

f) Erected and secured reinforcement shall be inspected and approved by the Engineer prior to placement of concrete.

g)All steel used for reinforcement shall be free from loose scales, grease, oil, paint, dirt, loose rust, bituminous material or any other substance that will reduce the bond between the steel and the concrete.

h)For payment of work done, the actual quality of steel embedded in concrete as calculated and approved by the Engineer, irrespective of the level or the height at which the work is done, shall be taken, the unit rate shall cover all wastage binding wire etc. for which no separate payment shall be made. Laps as shown on the drawings or as approved by the Engineer, and, minimum number of chairs and spacer bars to keep the reinforcement in place and approved by the Engineer, shall be measured and paid for.

23 FORM WORK

A) The formwork shall consist of shores, bracings, sides of beams and columns, bottom of slabs, sides of walls etc. including ties, anchors, hangers inserts, etc. which shall be completely designed and planned for the work. False work shall be so constructed that vertical adjustments can be made to compensate for take up and settlements.

B) The design and engineering of the formwork as well as its construction shall be the responsibility of the contractor. If so instructed the design/ calculations for the design of the formwork shall be submitted to the Engineer for approval before proceeding with the work. The engineer's approval shall not however, relieve the contractor of the full

Responsibility for the design and construction of the same. The design shall take into account all the loads- vertical as well as lateral, including live and vibration loads

C) Formwork shall be of timber, metal, plastic, etc. For special finishes the formwork may be lined with steel sheets, plywood oil tempered hard board, etc.

D) Formwork shall be so designed and constructed that the removal will not damage the concrete. Where exposed, smooth or rubbed concrete finishes are required, the forms shall be constructed with plywood lining and with special care so that the resulting concrete surfaces require minimum finish.

E) The shuttering shall be braced, strutted, propped and so supported that it shall not deform underweight and pressure of the concrete and also due to movement of men and materials. Bamboos shall not be used as props or cross bearers.

F) The contractor shall record on the drawings or a special register, the date upon which the concrete is placed in the form for each part of the work and the dates on which the shuttering is removed there from. In no circumstances shall forms be struck until the concrete reaches strength of at least twice the stress due to self-weight and any constructions / erection loading to which the concrete may be subjected at time of striking formwork.

24. CONTROLLED CONCRETE

All concrete in the works shall be 'controlled concrete' as defined in IS: 456, unless it is a nominal mix viz 1:4:8 or 1:2:4. Whether reinforced or otherwise, all controlled concrete works to be carried out shall be divide into the following specifications.

GRADE	Specified Characteristic Strength of 150 mm cubes	
	20 Days	**07 Days**
	(N /Sq. mm)	(N/ Sq. mm)
M10	10	7.0
M15	15	10.0
M20	20	13.5
M25	25	17.5
M30	30	20.0

The characteristic strength is defined as the strength of material below which not more than 5 per cent of the test results are expected to fall. The tests shall be conducted in accordance with IS: 516

25 MIXDESIGN

The mix shall be so designed to produce the grade of concrete having the required workability and characteristic strength no less than appropriate values specified. This is a procedure to investigate the grading of aggregates, water cement ratio, workability and the quantity of cement required to give works cubes of the characteristic strength specified . The proportions of mix shall be determined by weight. Adjustment of aggregates proportions due to moisture present in the aggregate shall be made. Mix proportioning shall be carried out according to the ACI Standard designation ACI613 or 'Design of concrete Mixes' –Road Research Note No.4, Department of scientific and Industrial Research, U.K.

Whenever there is a change either in required strength of concrete or water-cement ratio or workability or the source of aggregates and / or cement, fresh tests shall be Carried out to determine the revises proportion of the mix to suit the altered condition. While fixing the water cement ratio for the mix, assistance may be derived from the standard graph relating 28 days compressive strength to different w/c ratios and the 7 days compressive strength of cement in accordance with IS:269

26 SAMPLEING AND TESTING OF CONCRETE

A. Samples from fresh concrete shall be taken as per IS: 1199 and cubes shall be made, cured and tested at 28 days in accordance with IS: 516. In order to get relatively quicker idea of the quality of concrete, compressive strength tests at7 days may be carried out in addition. For general guidance the values given in the table (see 09 above) may be used.

B) At least 6 cubes of each class of concrete shall be made for every 150 Cu M. Concrete or part thereof. Such samples shall be drawn on each day for each type of concrete. Of each set of 6 cubes, 3 shall be tested at 7 days age and 3 to 28 days age. The laboratory test results shall be

Tabulated and furnished to the Engineer. The Engineer will pass the concrete if average strength of the specimens tested is not less than the strength specified , subject only to the condition that not more than one of the 3 consecutive tests may give a value less than the specified strength and this value shall not be less than 90% of the specified strength.

C) Slumps test shall be carried out as often as demanded by the Engineer and invariably from the same batch of concrete from which test cubes are made. Slump test shall be done immediately after sampling.

27. ADMIXTURES

A) Admixtures may be used only with the approval of the Engineer and with the assurance that with the passage of time, neither the compressive strength nor its durability will be reduced. Calcium chloride shall not be used for accelerating set of cement for any concrete containing reinforcement or embedded steel parts. Admixtures shall be used as per the manufacturer's specifications and in the manner and with control specified by the Engineer.

B) Where specified and approved by the Engineer, water reducing lignosulfonate mixture shall be added in quantities specified by the Engineer.

C) Where specified and approved by Engineer, waterproofing agent confirming to IS: 2645, shall be added in quantities specified by the Engineer.

D) Retarding agents shall be added in quantities specified, to the concrete mix where specified by the Engineer

E) The Engineer may at his discretion, instruct the Contractor to use any other admixture in the concrete.

F) Admixtures like micro silica, fly ash in O.P.C. 43 or 53 grade cement, silica fume liquid or slag etc. shall be used with prior approval from consultant. Compatibility of all above admixtures with cement must be checked before its use.

28 OTHER TESTS

A) The Engineer, if he so desires, may order test to carried out on cement, sand coarse aggregates or water in accordance with the relevant Indian Standard. This test would normally be ordered to be carried out only if the Engineer feels the materials are not in accordance with the specifications or if the specified concrete strength is not obtained. If the tests are successful, the Employer shall pay for all such additional tests, otherwise the Contractor shall have to pay for them.

B) In the event of any work suspected to be faulty – material or workmanship, or both, the Engineer requiring its removal and reconstruction may order, or the Contractor may request that it should be load tested.

The test load shall be 125 per cent of the maximum superimposed load for which the structure was designed. Such load test shall not be applied before 56 days after the effective hardening of the concrete. The test load shall be maintained for 24 hours before removal.

If within 24 hours of the removal of the load, the structure does not show a recovery of at least 75% of the maximum deflection shown during the 24 hours under load, the test loading shall be repeated after a lapse of at least 72 hours. If the recovery after the second test is not least 75 percent of the maximum deflection shown the second test, the structure shall be considered to have failed the test.

C) Any other tests, e.g. taking out in an approved manner concrete cores, examination and tests on such cores removed from such parts of the structure as directed by the Engineer, sonic testing etc. shall be carried out by the Contractor.

29. PREPARATION, FINAL INSPECTION AND APPROVAL BEFORE CONCRETE PLACEMENT:-

a) Before the concrete is actually placed in position, the inside of formwork shall be inspected to see that are cleaned and well oiled.

b) The various trades shall be permitted to install conduits, hangers, anchors, inserts, sleeves, bolts, and miscellaneous embedment to be cast in the concrete as indicated on the drawings or as is necessary for the proper execution of the works. The Contractor shall cooperate fully with the other agencies (if any), and shall permit the use of the scaffolding, formwork etc. at no extra cost.

c) All embedded parts, inserts, etc. supplied by the Employer or Contractor shall be correctly positioned and securely held in the forms to prevent displacement during placement and vibrating in the rates.

d) All anchor bolts shall be positioned and kept in place with the help of properly manufactured templates. The use of all such templates \, fixtures etc. shall be deemed to be included in the rates.

e) Opening, holes, pockets etc. shall be provided in the concrete work in the positions indicated in the drawings or as directed by the Engineer.

f) Reinforcement and other items to be cast in the concrete shall have clean surfaces that will not impair bond.

g) Prior to concrete placement, all work shall be inspected and approved by the Engineer. If found satisfactory, concrete shall not be poured until after all defects have been rectified at the Contractor's cost. Approval by the Engineer of any and all materials and work as required herein shall not relieve the Contractor from his obligation to produce finished concrete in accordance with the drawings and specifications.

h) Immediately before concrete placement begins prepared surface except formwork which will come in contact with the concrete to be placed shall be covered with a bonding mortar of cement and sand in the same proportion as for the concrete.

i)No concrete shall be placed in wet weather or on a water covered surface. Any concrete that has been washed by heavy rains shall be entirely removed, if there is any sign of cement and sand having been washed away from the concrete mixture. To guard against damage which may be caused by rains, the works shall be covered with tarpaulins immediately after the concrete has been placed and

compacted before leaving the work unattended. Any water accumulation on the surface of the newly placed concrete shall be removed by approved means and no concrete shall be placed thereon until such water is removed. To avoid flow of water over or around freshly- placed concrete, suitable drains and sumps shall be provided.

30. TRANSPORTATION OFCONCRETE

A) All equipment used for mixing, transporting and placing of concrete shall be maintained in clean condition. These shall be thoroughly cleaned after each period of placement.

B) The means of conveyance of the mixed concrete from the mixer to the point of placement should be such that the concrete is placed in its final position before it becomes too stiff to work. The required consistency and plasticity shall be maintained without segregation or loss of slump. On no account shall water be added after the initial mixing.

31-. PLACING OF CONCRETE

A) Before any concrete is placed, the entire placing program, consisting of equipment, layout proposed procedures and methods shall be submitted to the Engineer for approval and no concrete shall be placed until has approval has been received. Equipment for conveying concrete shall be of such size and design as to ensure a practically continuous flow of concrete during depositing without segregation of materials, considering the size of the job and placement location.

B) Concrete shall be placed in its final position before the cement reaches its initial set and the concrete shall normally be compacted in its final position within 30 minutes of leaving the mixer. Once compacted, it shall not be disturbed.

C) Concrete shall in all case be deposited as nearly as practicable directly in its final position and shall not be re handled or caused to flow in a manner which will cause segregation loss of materials displacement of reinforcement shuttering or embedded inserts or impair its strength . For locations where direct placement is not possible and in narrow forms the Contractor shall provide suitable drop and ‘elephant trunks’ to confine the movement of concrete. Special care shall be taken when concrete is to be Dropped from a height especially if reinforcement is in the way. In normal cases concrete shall not be dropped from a height more than 1 M or handled in a manner that will cause segregation.

D) Where it is necessary to use transfer chutes, specific approval of Engineer must be obtained to type, length & slopes, baffles, vertical terminals & timing of operations. Concrete shall not be permitted to fall from the end of the chutes by more than 1M. Chutes shall have slopes not flatter than 1 vertical: 3 horizontal & not steeper than 1 vert: 2 hour. Chutes shall be made of metal of metal lined and of rounded cross section.

E) Concrete once started shall be continuous until the pour is completed. It shall be placed in successive horizontal layers of uniform thickness ranging from 150 mm to 900 mm as directed by the Engineer. These shall be placed as rapidly as practicable to prevent the formation of cold joints or planes of weakness between two layers of the pour. The thickness of each layer shall be such that it can be deposited before stiffened. That pour and bending planes shall be approximately horizontal, unless otherwise instructed.

F) COMPACTION:

Concrete shall be compacted during placing, with approved vibrating equipment until the concrete has been compacted to the maximum practicable density, is free of pockets of coarse aggregates and fits tightly against all form surface reinforcement and embedded fixtures. Concrete should be free from voids or cavities. The vibrators used shall conform to IS specifications and their use shall be consistent with the concrete mix and caution exercised not to over vibrate the concrete to the point that segregation results.

G)Bleeding or free water on top of concrete being deposited into the forms, shall be cause to stop the concrete pour and the conditions causing this defect corrected before any further concerting is resumed.

32 CONSTRUCTION JOINTS AND KEYS:

A) Concrete shall be placed without interruption until completion of the part of the work between predetermined construction joints. If stopping of concrete becomes unavoidable anywhere, a properly formed construction joint shall be made where the work is stopped. Joints shall be either vertical or horizontal, unless shown otherwise on drawings.

B) In a column, the joint shall be formed 75 mm below the lowest soffit of the beams including haunches, if any.

In a beam the joint shall be vertical and at the center or within the middle third of the span. In a slab the joint shall be vertical & parallel to the main reinforcement. Where it is unavoidably at right angles to the main reinforcement, the joint shall be vertical and at the middle of the span. In liquid retaining structures, vertical construction joints shall not be permitted, unless indicated on the drawings. Where a horizontal construction joint is required, to resist water pressure, special care shall be taken in all phases of its construction to ensure maximum water tightness.

C) On resuming concreting at the construction joint before concreting, the roughened joint surface shall be thoroughly cleaned and loose matter removed and then treated with a thin layer of cement grout of proportion specified by Engineer and worked well into the surface. The new concrete shall be well worked against the prepared surface before the grout mortar sets.

33 CURING AND PROTECTING

a) All concrete shall be cured by keeping it continuously damp for the period of time required for complete hydration and hardening to take place. Preference shall be given to use of continuous sprays or pounded water, continuously saturated coverings of sacking, hessian or other absorbent materials, or approved effective curing compounds applied with spraying equipment capable of producing a smooth, even textured coat. The quality of curing water shall be the same as that used for mixing.

b) Fresh concrete shall be kept continuously wet for a minimum period of 10 days from the date of placing of concrete, following a lapse of 12 to 14 hours after lying concrete. The curing of horizontal surfaces exposed to the drying winds shall begin immediately the concrete has hardened. Water shall be applied to unformed concrete surface within 1 hour after concrete has set. Water shall be applied to

formed surface immediately upon removal of forms. Quantity of water applied shall be controlled so as to prevent erosion of freshly placed concrete.

c) Fresh concrete shall be protected from the elements from defacements and damage due to construction operations by leaving forms in place for an ample period. Placing tarpaulins shall protect newly placed concrete from rain, sun and winds.

34. REPAIR AND REPLACEMENT OF UNSATISFACTORY CONCRETE

a) After the shuttering is removed, the surface of concrete shall be carefully gone over and all defective areas called to the attention of the Engineer who may permit patching of the defective areas or also reject the concrete unit either partially or in its entirety. Rejected concrete shall be removed carefully and replaced by the Contractor at no additional expense to the Employer.

b) Superficial honeycombed surface and rough patches shall be made good immediately after of the shuttering in the presence of the Engineer's Representative. Mortar composed of 1 part cement to 1.5 parts of sand passing 2.36 mm sieve shall be used for patching. All loose stone and materials adhering to the concrete shall be removed completely. The mortar shall be well worked into the surface with a wooden float. Excess water shall be avoided.

c) Holes left by form bolts etc. shall be filled up and made good as in (b)above

d) The use of epoxy for bonding fresh concrete use for repairs will be permitted upon written approval of the Engineer. Epoxies shall be applied in strict accordance with the instructions of the manufacturer.

e) Defective concrete shall be carefully cut as per the instructions of the Engineer, and solid concrete is reached. This patch shall be roughened and cleaned and thoroughly soaked with clean water until absorption stops. A 5mm thick layer of grout (equal parts of cement & sand) shall be well brushed into the patch. This shall be followed immediately by the patching concrete. Which shall be well consolidated with a wooden float and left slightly proud of the surrounding surface. The concrete patch shall be built up in 10mm thick layers. After an hour or more (as per weather conditions), it shall be worked off flush with a wooden float and a smooth finish obtained by wiping with a hessian cloth. The mix for patching shall be in the same proportion as that used in the concrete being repaired, although some reduction in the maximum size of the coarse aggregates may be necessary and the mix shall be kept as dry as possible. The repaired area shall be kept continuously wet for not less than 10 days.

35. FINISHING

Exposed concrete shall mean any concrete, other than floors or slabs, exposed to view upon completion of job. Unless otherwise specified, the standard finish for exposed concrete shall be a smooth finish. A smooth finish shall be obtained with the use of lined or plywood forms having smooth and even surface and edges. Panels and form linings shall be of uniform size and be as large as practicable and installed with closed joints. Upon removal of forms, the joint marks reasonably smooth and unmarred. This specifications covers the general requirement for general building works viz. masonry plastering flooring protection, waterproofing, doors, painting and such other related works forming part of this job, which may be required to be carried out though not specifically mentioned above. The Contractor shall furnish all materials, labor, tools, plants, any and everything necessary for carrying out the work.

SPECIAL CONDITIONS OF THE CONTRACT:

1. The contractor shall depute one full time qualified, experienced degree / diploma holder engineer for full time supervision who is well conversant with repairs. The deployment of contractor's site engineer and supervisor shall be got approved from the Consultant. Presence of Site Engineer of the Contractor available all time is mandatory.

2. Effective Date of contract shall be considered as that date of issue of FOI / Letter of Intent.

3. Time is essence of the Contract and the contractor shall submit detailed program for completion and shall obtain approval from the Owner / Consultant.

4. **Liquidated damage shall be Rs.5, 000/- per day, subject to a maximum of 5% of the total value of the contract.**

5. In accordance with the prevailing Income Tax regulation, the Owner shall deduct Income Tax from the running bills.

6. In case of any dispute, if the work is suspended, the site shall be handed over to the Owner and the Contractor shall remove scaffolding, tools and tackles etc., from the site at the direction of the consultant.

7. The Contractor shall bear in mind that he will have to carry out certain part of the work inside the premises. He shall take utmost care to see that.

   a) Working area are kept clean,
   b) Furniture or any other properties of the Company are not damaged.
   c) No inconvenience / nuisance is caused during the work,
   d) Plastic sheets are spread on the floor to save them from staining,(Except with P.O.P layer as specified)
   e) Hessian cloth curtains are hanged over scaffolding.
   f) Jute covering is provided over wooden windows and other windows wherever possible.

g) Staircase and passage area including access area shall be cleaned at the end of the day before closing the work for the day.

No extra cost shall be paid for the above mentioned safety measure. The Contractor shall replace all the broken glasses and any damage to the property. During breaking or damage during progress of the work due falling debris etc., shall be rectified by him at his own cost.

8. The Contractor shall be responsible for the Security of the Premises and flats and shall take necessary precaution against thefts of the company's materials.
9. The owner will recover from any money due to Contractor, subject to the recommendation of the consultant towards cost of any damage/ replacement / repairs that might occur to any property due to negligence on part of the contractor or his workers.

10. **It is the responsibility of the contractor's to obtain permission for use of the electricity for construction purpose. The owner shall not supply water for the work and it will be responsibility of the contractor to procure water suitable for the work, storage and proper distribution. The contractor shall directly handle all Municipal, Corporation, Formalities VIZ. Malaria, water, sewage department etc. No extra shall be paid for the same.**

11. The contractor shall be responsible for disposing off the debris outside the owners premises. He will not dump the same on roads / garbage dumps in the area. He will be responsible to attend to complaints that might arise from improper disposing.

12. The rates shall be valid for working at all heights and depth. No extra payment shall be made for scaffolding, staging, ladders, etc. for transportation of labor and material to higher or lower level.

13. River sand to be used for the works & shall be thoroughly washed before using.

14. The contractor shall use materials approved by consulting engineer or his representative unless otherwise specified in tender document. Consulting engineer possess right to change/disapprove material specified without assigning any reason.

15. The contractor will be allowed to minimum bill amount of 25% of work order per bill. Payment shall make within 30 working days from date of receipt of certified bill by consultant**.**

16. **The defects Liability period shall be 12 months** from the date of Completion.

17. Period of running bill measurement and certificate will be 15 days and period of final measurement and valuation shall be 2 months from the date of Completion.

18. The retention Money will be refunded after satisfactory completion of Defects Liability Period without any interest.

19. The contractor shall take adequate Third Party Liability Insurance cover for any one accident and the number of accident occurring during repairing period.

20. All sanitary installation, water supply and drainage works shall be carried out through a licensed plumber in a manner complying in all respect with requirements of by laws of B.M.C. Municipal Corporation.

21. Measurement of all items will be carried out on the actual area attended and as per IS 1200. However, when the tender specifies otherwise, the mode of measurement as specified in the tender shall be final. The decision of the Consultant/owner regarding mode of measurement shall be final. The Contractor shall take adequate precautions, to enter measurements of such items/ materials which cannot be checked subsequently, into Measurement Book on daily basis shall also obtain approval of the Owner/ Consultant's representative on the same day.

22. All Plumbing work shall be tested as directed by the Consultant .The cost of such testing shall not be paid extra.

23. Retention Money can be released after expiry of Defect Liability Period provided that there was no defect or the same have been properly attended and rectified by the Vendor and certified by the consultant. The amount of Retention money, which shall be deducted from each running bill, shall not carry any interest.

24. The contractor shall not put any signboard bearing any names without prior approval of the Owner.

25. The contractor shall provide following items at the site all the time:

- Mixing tray for mortar;
- Concrete cutter & mechanical breaker;
- Mixing tray for polymer Modified mortar;
- Breaking Machine (For Terrace waterproofing/Plaster/concrete);
- Weighing machine;
- Measuring jars (100ml, 500ml);
- Measuring tapes 3 m, 30 m.
- Glass Silt jars for checking sand quality.
- Complaint register for members of the B&R House;
- Material register for record of material received & consumed at site.
- Triplicate book for receiving instruction from the consultant;
- Measurement book for recording measurements on regular basis.
- Daily report book to maintain for persons employed & work done with location

- Few chairs & a table for all paper work.

26. The company shall arrange to provide on chargeable basis to the contract, only the following facilities, materials & equipment's to the extent required for the execution of the works in pursuant to the contract.

a) Construction Power at one point to be provided by owner. Necessary distribution to be done by contractor at his own cost. Removal of electrical wiring for facilitating civil works shall be done by contractor. Refaxing shall be done by licensed electrician & shall be done by contractor at no extra cost.

27. The contractor shall within the quoted rates, make his own arrangement for the accommodations of his all workmen, supervisory staff and other persons outside the owner premises and their transport to site and back. No space for accommodation will be provided within/near the premises.

28. No advance on any account shall be payable to the contractor in pursuant to this contract.

Income Tax will be deducted from the contractor's all bills by cash at source as per latest income tax act and rules framed there under.

29. The contractor's scope of supply of materials/facilities shall, within his quoted rates include the following, but not limited to these:

a. All the materials cement, sand, stone chips, reinforcement & all other material required for painting, finishing & other miscellaneous work, such as plumbing & sanitary, flooring, down comer etc. & machineries required to complete the job successfully.

b. Required number of supervisors.

c. All categories of laborer for carrying out the job as per bill of quantities & other documents of this NIT.

d. Accommodation for all categories of laborers & supervisors.

e. To & fro transportation for the workmen.

f. Safety equipment like safety belts, safety nets, safety helmets, safety shoes, safety hand gloves, etc.

g. **Only River Sand or packaged P0ZZO laic sand to be used for Plastering (Unless premix plaster is specified) & concreting work.**

h. **All materials (except construction power which will be given on chargeable basis) shall be arranged and supplied by contractor.**

30. Taxes and duties

30.01 GST on Works Contract

The contractor's rate shall be exclusive of GST on Works Contract and payable extra as applicable. The contractor should take registration under Maharashtra Goods & Service Tax Act.

31.2 Other Taxes

The Contractor shall be exclusively responsible for payment of any and all taxes, duties etc. now or hereafter imposed, increased or modified in respect of all materials supplied under the scope of work of the contractor covered in this tender.

TECHNICAL SPECIFICATIONS FOR REPAIR WORK

Note: In case of any conflict between specifications / scope of work etc. decision of Consultant in consultation with the Owner is final.

A) ENABLING & GENERAL WORKS

1 SCAFFOLDING:

Scaffolding shall be safe and erect. Under no circumstances will holes be allowed to be made in the walls to support scaffolding. Typing of scaffolding to the old pipes of the building may be disallowed. Temporary props between balconies or Chajja to give lateral support to the scaffolding will be permitted where feasible. In general steel scaffolding will be preferred.

Steel scaffolding and its bracings, connections .etc. shall be as per relevant Indian Standards. Lateral tie to the building shall be done preferably using M.S. pipes and couplers. .Where access inside the building is not available connection shall be made using anchor bolts of approved quality. Unless otherwise mentioned no separate payment shall be made for lateral ties /supports / anchors.

2. PROVIDING PLY PROTECTION TO WINDOWS

The existing Aluminum / Wooden windows of all the flats should be covered carefully with minimum 6mm thick ply wood, so as to cause minimum damages to the windows. The plywood should be fixed properly with due care and should be fixed in such a fashion that the windows can be opened with ease. In case where the window is already damaged before fixing, the contractor should bring it to the notice of the concerned flat owner, but in case the contractor's men damage the windows then he will have to repair the same at his cost.

3 .BREAKING OF PLASTER

The coats of plaster over concrete and masonry walls will be removed carefully with chisel and hammer such that the masonry / concrete element underneath is not damaged. All coats of the plaster shall be removed along with visible traces of cement / lime and the surface thoroughly cleaned and hacked where required, to receive new coats of plaster. Chiseling and raking of masonry joints shall also be done where required especially between the RCC members and Masonry blocks for ease and neatness in working; the edges of the exposed portions shall be straightened .Provide burden cloth for safety all around the scaffolding and temporary 6mmthk. Ply for window protection. Remove the existing tree growth by uprooting along with the root completely and Acid treatment to be carried out by using the mixture of Sulphuric acid, Sodium Sulphate, Alum and Common Salt.

Measurement for breaking plaster shall be taken as the actual area exposed projected to the original surface of the element. Where the plaster is removed together with the chiseling or breaking of concrete no measurement shall be taken separately for this.

4. BREAKING OF REINFORCEDCONCRETE:

Part of full reinforcement concrete element viz. slab, beam, wall, column, fin etc. will be broken carefully using chisel and hammer. For neatness of work, the edges of the broken portion shall be fairly straight. The broken surface shall be chiseled straight and cleaned so as to facilitate bond with new mortar /concrete. All highly deteriorated steel reinforcement shall be cut / removed as directed. Where insufficient lap length for new reinforcement is available, additional concrete may have to be broken in order to expose adequate length of the existing reinforcement as may be directed.

Measurement shall be taken as actual volume of concrete broken with the steel based on the original dimension of the concrete element. No separate payment shall be made for removing the reinforcement rods.

5. PROPPING

a. Provide and put up in place Steel Props or Wooden Props with proper keys, wherever instructed by the consultant.

b. The props should be put up in such a fashion, so as to relieve the load from the affected member, which has to be treated.

B. WATERPROOFINGITEMS

1. APP MODIFIED MEMBRANEWATERPRROFING

The surface to be waterproofed shall be dry, clean smooth and free from dust and loose particles.

For a seven layer treatment: bitumen primer shall be applied conforming to IS: 3384. Over the primer Coat, hot bitumen conforming to IS: 1580 shall be applied at a rate of 1.2 kg / Sq. M. Hessian based felt type 3 grade 2 conforming to IS: 1322 shall be spread and embedded in the previously laid of hot bitumen while hot. These two layers shall be repeated again before another layer of hot bitumen is again applied over the tar felt layer at the rate of 1.2 Kg. Per Sq. M. pea- size gravel or grit is to be then uniformly spread at the rate of .008 cubic M. per square M.. The end side laps of each sheet shall not be less than 75 mm and mm respectively; staggered and embedded in chases made in the wall and made good in plaster. The standard of the waterproofing shall comply with IS: 1346

This System is self-finished; joint less monolithic membranes provide excellent water tight and vapor barrier system.

High tensile & tear resistance Can take thermal & structural stresses effectively, without any fatigue. Laid quickly & easily; safe & environment friendly.

Do not undergo early ageing, thus provide long life durable membrane. Easy melting & fixing, thus saving on usage of expensive gases. Available in 1.5, 2, 3, & 4 mm thickness APP modified membrane rolls.

METHOD OF APPLICATION
STEP WISE METHOD OF APPLICATION OF APP MEMBRANE

a) Check the base surface for its soundness before application of APP membrane

b) Check the surface for the slope , the minimum slope shall be I 1n 100, if the slope is not there & stagnation is possible ,it is advised to create the minimum slope required for best results

c) Repair the loose / un sound portions of the surface by breaking and re doing the same patch by polymer modified mortar and allow it to cure.

d) Open all cracks up to 5 mm width with the help of a grinder & fill them with the help of Acrylic non shrink crack filling compound, cracks above 5 mm shall be repaired with polymer modified mortar. Construction / expansion joints shall be filled first with Poly sulphide sealant before primer application

e) Clean and wire brush the surface completely before application of Primer and check that moisture content is not more than 15 % in the substrate

f) Apply solvent based bitumen primer on the dry – clean surface @ 3-5 Sq. Mtr. per liter and allow it to dry for 4-6hours

g) Start application of APP membrane from the lowest end to higher end below the drip mould of the parapet wall with the help of a gas torch

h) Start application of 2nd roll by keeping an overlap margin of 100 mm at the overlap joints

i) Over heat the membrane at the overlap joints to bleed out the bitumen for 10- 15mm an d flush the same with good finish with hot trowel

j) Finally apply two coats of bituminous aluminum paint @ 3-5 sq. Mtr. per liter on the top of the laid APP membrane for the non-trafficable roofs /area and or protect the membrane with a protective screed / BB Coba for the area subjected to heavy movements & wear &tear.

2 WATERPROOFING TO TERRACE TOP BY TRADITIONAL METHOD WITH CHINA MOSAICTOPPING

a. Remove the existing Waterproofing layer completely up to the bare concrete with the help of **BOSCH Make Electric breaker (GSH 4 / GSH 7) or equivalent**, to be used for puncturing & subsequently chisel & hammer using chisel at an angle to ensure that the concrete does not get damaged. Dispose of the removed debris and clean the bare slab thoroughly.

b. Open the visible cracks of the bare concrete in V groove & fill the cracks with a paste of Approved Polymer, cement & water. Apply a coat of Polymer Emulsion: Cement slurry of 1: 1.5 to the entire bare slab.

c. Open the joint between the parapet wall and the slab in a 15mm to 20mm V groove and then fill the same with a 1:2 C.M. with addition of integral WP compound.

d. Lay Brick Bat Coba **of average 4" thick** in 1:5 C.M. with addition of integral WP compound, with proper slope & alignment. Slope to be maintained at 1" per 10'length.

e. Carry out pond test by ponding water on the brickbat Coba for a minimum 7days.

f. Fill the gaps in the brickbats using a 1:4 C.M. with addition of integral WP compound. All gaps to be filled properly and the entire bricks should be completely covered.

g. Provide & lay in place China Mosaic Topping with mixed coloured chips in proper slope as the finishing coat.

h. Coving (Vatta) height to be maintained at 9" or230mm.

3 WATERPROOFING TO TERRACE TOP BY CHEMICAL COATING WITH CHINA MOSAICTOPPING

Open the visible cracks on the top surface in V groove & fill the cracks with a paste of Approved Polymer, cement & water.

Apply two coats of Polymer Emulsion: Cement slurry of 1: 1.5 to the entire bare slab. The second coat should be applied in a manner so that the brush is worked perpendicular to the direction of application of the first coat. (The minimum over coating interval between two coats should be 24hours.)

Carry out pond test by ponding water on the coated surface for a minimum 3 days.

Provide & lay in place China Mosaic Topping with mixed coloured chips in proper slope as the finishing coat.

4 WATER PROOFING OF CHHAJJA / BALCONYTOP:

1. Breaking existing water-proofing treatment and Coba to expose RCC slab by sharp chisel and light hammer only so as not to damage existing RCC slab etc. Lowering and throwing out debris.

2. Clean surface of all particulars and dust washing the same.

3. Subsequently RCC slab should be inspected for hair crack loose surface which should be made good under consultant's instruction.

4. First at the junction of parapet wall and slab, a key of approx. 2" x 2" should be chipped at all length where metal packing will be done on cement paste and where vatta will be constructed (Not applicable for Chhajja waterproofing).

5. Applying cement slurry with waterproofing compound on cleaned slab surface filling uneven surface dents etc.

6. Laying brickbat Coba CM 1:3 with approved water-proofing compound with necessary slope for easy flow of water.

7. This portion should be thoroughly cured for 4/6 days and observe for leakage before IPS is done.

8. Providing Indian patent stone flooring in 1:2:3 in 12.5 chips 25mm thickness with additional of waterproofing compound to required finish slope and finished with round vatta on triangular brickbat Coba at junction of parapet wall and slab. Finally, the top surface shall be covered with joint less waterproof plaster in CM 1:3 in 15 mm thickness finished smooth trowel. Curing should be done continuously for 14 days with water remaining full in days prepared for the same.

Finish the entire Chhajja& Balcony top, including vatta, curing etc. complete.

5. CEMENT SLURRY GROUTING

Using expansive additive @ 225gm / bag of cement or as per mfrs. Specifications to ensure shrinkage compensation & better flow in capillary using P.V.C. perforated nipples & manual pump with pressure gauge having capacity of 140 P.S.I. Water content shall not exceed 30ltr/ Bag of cement. Polymer shall be added if specified & general alignment of hole making in concrete shall be 1 meter C/C. Nipples shall be cut & filled with fast setting plugging mortar once slurry come out of neighboring hole.

6. WATERPROOFING TREATMENT TOBATHROOMS

a. Break the existing waterproofing treatment to slab level, lower & cart away the debris.

b. Fill the cracks in the damaged slab by using approved sealant.

c. Provide & apply coating of slurry made of Polymer: Cement (1:1.5) to clean & treated slab plus at least 6-9” of the vertical walls.

d. Provide & lay Brick Bat Coba average 3”thk in 1:4 C.M. with addition of ICWPA, as directed with proper slope.

e. Carry out pond test by storing water for 48hours.

f. Finish with Kotah stone of size 2’ X 1-1/2’, of minimum 1” thickness over a base in C.M. 1:4

7. WATERPROOFING TREATMENT TOW.C.

a. Break the existing waterproofing treatment to slab level, lower & cart away the debris.

b. Fill the cracks in the damaged slab by using approved sealant.

c. Provide & apply coating of slurry made of Polymer: Cement (1:1.5) to cleaned & treated slab Plus at least 6-9" of the vertical walls

d. Provide & lay Brick Bat Coba average 3"thk in 1:4 C.M. with addition of ICWPA, as directed with proper slope.

e. Carry out pond test by storing water for 48hours.

f. Provide & fix white Orissa Pan 23" size including changing the flush connector pipe.

g. Back fill the balance area to proper level, lay base 1"thk C.M. 1: 4 & finish with white glazed tiles 6" x6".

8. WATERPROOFING TO KITCHEN NAHANITRAP

a. Break the existing waterproofing treatment to the sunk slab level, lower & cart away the debris.

b. Fill the cracks in the damaged sunk slab by using approved sealant.

c. Provide & apply coating of slurry made of Polymer: Cement (1: 1.5) to cleaned & treated sunk slab plus at least 6" of the vertical walls.

d. Provide & lay Brick Bat Coba average 2"thk in 1:4 C.M. with addition of ICWPA, as directed.

e. Carry out pond test by storing water for 48hours.

f. Provide & fix new PVC Nahani trap of 3" size including changing the connector pipe.

g. Back fill the balance area to proper level, lay base 1"thk in C.M. 1:4 with addition of ICWPA & finish with white glazed tiles 6" x6".

C. STRUCTURALITEMS

1. EXTERNAL AND INTERNAL STRUCTURAL REPAIRS TO BEAMS & COLUMNS BY POLYMER BUILT UPTECHNIQUE.

a. Break open the structural member to expose reinforcement steel & dispose of the debris arising from the same.

b. Clean the exposed reinforcement steel thoroughly by removing rust / scaling by chiseling / tapping / wire brushing.

c. Provide & apply rust converter to the exposed steel & allow to dry for 24hours.

d. Provide & apply protective coat of slurry of Polymer Emulsion: cement (1: 1½) to the reinforcement steel.

e. Build up damaged RCC member to its original shape in layers of 3/4" each by polymer modified cementitious mortar in the following proportion.

Approved Polymer	10Kg
Cement	50Kg
Quartz Sand	150Kg
Graded Metal	50Kg
Water	As directed

f. Before every layer a bond coat of slurry of Polymer Emulsion: cement (1:1 ½) to be applied to the entire section.

NOTE: - Polymer consumption will be strictly reconciled at 0.200 kg per Sq.Ft. Of the work carried out. Basic rate of Polymer to be taken as Rs.200/- per kg

NOTE: - The measurement of this item shall be made in Sq.Ft. which is inclusive of layers up to 25mm thickness & shall include cost of all operations viz. a - f. An additional layer of polymer to be applied to sections over and above 25mmthickness

NOTE: - Extra steel, if required, may have to be incorporated in the RCC structural member & will be paid extra at the mutually agreed rates.

2. APPLICATION OF RUST PASSIVATOR: The entire surface of the exposed reinforced concrete element should be thoroughly cleaned. The reinforcement rods must be thoroughly cleaned using a chisel, scrapper, wire brush and emery Paper. The rust Passivator is to be applied carefully on the exposed dry surfaces of the reinforcement rods with a brush or cloth. The Passivator must be applied as per the manufacturer specifications .Allow air drying for 24 hours before any further treatment is done on this after cleaning. Measurement shall be taken of the entire chiseled area where reinforcement rods are exposed and rust Passivator applied.

3.NON STRUCTURAL R.C.C. REPAIR USING NON POLYMER MORTAR (KHADI EMBEDDING)

4 APPLICATION OF MORTAR/CONCRETE

Preparation of surface:

A good base or foundation shall be prepared for successful application of mortar/concrete.

All unsound/weak concrete material shall first be removed by the contractor up to the required depth as directed by engineer. Chipping shall continue until there are no offsets in the cavity that will cause an abrupt change in the thickness of repaired surface. No square shoulders shall be at the perimeter of the cavity all edges shall be tapered. The final cube surface shall be critically examined to make sure that it is sound and properly shaped.

After it has been ensured that the surface which mortar/concrete is to be bonded is sound, it shall be cleaned off all loose and foreign material by means of sand blasting or stiff wire brushing as instructed by engineer. All dust and loose particles resulting from such pre-treatments shall be removed oil free air blast.

Bonding slurry and application:
The contractor shall wet down the surfaces ensuring that they are saturated but free of surface water. Bonding slurry shall be prepared by mixing thoroughly 2 parts of cement to 1 part of water to a lump-free consistency.

Application of cement mortar/concrete:
Cement shall be carried out in efficient concrete mixer. However, the engineer may allow hand mixing in case total weight of mix per batch is less than 50 Kgs. In case of hand mixing, the contractor shall mix 10% additional cement.

The mixer shall be charged with the required 4 quantity of coarse aggregate (where used); fine aggregates, cement and premixing shall be carried out for approximately half a minute. Required quantity of water shall then be added and further mixing shall be carried out for 1 to 1-1/2 minutes to obtain working consistency. Care shall be taken to avoid excessive water.

Rendering Cement mortar/concrete shall be done after applying bonding slurry to the prepared surface while the bonding coat is still tacky. After application of mortar/concrete the surface shall be closed using a wooden float and steel trowel giving it a smooth finish.

5. CURING:

New concrete shall be maintained damp for a period of 2 weeks minimum. . New plaster shall be cured at least 3 times a day for a period for a not less than 10 days. The 1stcoat of plaster shall be cured for a period not less than 3days. If required the surface shall be maintained damp using a wet hessian cloth.

6. JACKETING OF COLUMNS

a. Break open the brickwork up to at least 2’ around the structural member to be jacketed.

b. Provide necessary steel / wooden props with proper keys, so as to relieve the load from the structural member to be jacketed.

c. Excavate up to footing level & provide additional footing of 6" thickness in 1:2:4 PCC, as directed by the consultant

d. Break open the structural member to expose reinforcement steel & dispose of the debris arising from the same.

e. Clean the exposed reinforcement steel thoroughly by removing rust / scaling by chiseling / tapping / wire brushing.

f. Provide & apply rust converter to the exposed steel & allow drying for 24hours.

g. Provide & apply protective coat of slurry of Polymer Emulsion: cement (1 : 1½) to the reinforcement steel.

h. Provide necessary formwork around the damaged structural member, so as to increase the girth of the member by at least3"

i. Build up damaged RCC member to its revised shape by casting cementitious mortar in the proportion of **C: S: M:1: 11/2:3**.

j. De-mould the formwork and carry out proper curing of the built up member by keeping the same continuously moist with the help of a wet cloth.

Note: Steel details will be provided on site.

7. MICROCONCRETE TO THE RCCMEMBERS

a. Break open the structural members to expose the reinforcement steel and dispose of the debris arising from the same.

b. Clean the exposed reinforcement steel thoroughly by removing rust / scaling by chiseling / tapping / wire brushing.

c. Provide & apply rust converter to the exposed steel & allow to dry for 24hours.

d. Provide & apply protective coat of slurry of Polymer Emulsion: cement (1: 1½) to the reinforcement steel.

e. Provide necessary formwork around the damaged structural members to maintain the original size and plumb of the structural members.

f. Pour ready-mix micro concrete in the formwork which is formed by mixing 12.5 % of water by weight of micro concrete till it forms a flow able consistency.

g. Ensure that only sufficient quantity of micro concrete is mixed which can be consumed in about 15 to 20minutes.

h. Cure the same for 3 days to achieve the adequate properties.

8 CONCRETE REPAIRS USING SBR / POLYMER LATEX

Surface preparation of the area to be treated is very important. Mildly wet the concrete surface so that the concrete is saturated but the surface is free of water. Apply a bond coat of cement and SBR as per the manufacturer specifications. Whilst the bond coat is still wet, carefully apply and compact the desired SBR

modified cementitious repair mortar as per the manufacture instructions in layer so as to reinstate the concrete element. The sand used in the mortar shall be washed clean and of the required fineness. On vertical surface coats shall be applied up to 25mm thickness provided slumping does not occur. On larger flat surface coats should not exceed 6mm in thickness though several coats may be applied in quick succession – each coat setting of before the next is applied. When slumping occurs scratch the firm surface and allow to dry overnight And then repeat the process finish off the final coats. Mildly moisture cures for 24 hours and then allow to air dry. Measurement shall be taken for actual area covered by the repair mortar. In case the thickness is more than that specified in the Bill of Quantities, additional such measurement will be taken if the additional thickness is applied with a gap of 24 hours.

No measurement for additional bond coats shall be taken when required for layers to achieve the thickness specified in the Bill OF Quantities

9. LOW VISCOUS EPOXY GROUTING:

The concrete surface to be grouted must be thoroughly cleaned, wiped, dried and dust- free. The base and the curing agent are mixed in the specified proportions and gently stirred. The mix is sprayed / poured after 10- 15 minutes. The grouted surface shall be allowed to air dry for 3 days. For vertical surfaces the grout may be poured through muzzles / pipes embedded in the concrete element

10. CARBON FIBRE WRAP STRENGTHENING SYSTEM FOR SEVERE DAMAGED RCC MEMBERS

This systems offer major advantages over conventional repairs techniques, especially where uneven surfaces, irregular shapes or contours are involved. They consist of paper thin uni-directional fiber supplied in roll, rather than plate form. Such systems are ideal for repairing columns or other load bearing features. It is an externally bonded fiber reinforcement system for concrete and masonry structures. It is a uni-directional continuous fiber sheet (as opposed to a woven sheet); laminated with an epoxy matrix noted for its flexibility, ease of application and high strength. For an application to SEVERE damaged RCC members; very first to be removed all loose concrete cover & unsound concrete from the structural element, exposed reinforcement shall be cleaned and chemically de rusted & to be provided rust Passivator coating on exposed reinforcement.

A coat of epoxy resin primer shall be applied by brush on the cleaned concrete surface & followed by epoxy putty filler to level the substrate for the application of Carbon Fiber Wrap sheets. Next stage application of epoxy resin is applied on top of the epoxy putty/mortar treated concrete. Immediately after the application of this resin, the first Carbon Fiber Sheet shall be glued to the concrete surface. Afterwards, the sheet shall be impregnated again with the right mix of epoxy resin components. When the first layer would sufficiently harden, a second layer of sheet can be applied, and more as per the requirement of RCC member profile. Finally a coating of epoxy resin shall be applied to the hardened sheet.

11 RECASTING OF DAMAGED CHAJJAS / SLABS:

a. Remove all the loose and damaged concrete.
b. Clean all the exposed reinforcement steel using rusticide.

c. Provide additional 8mm ϕ steel wherever directed, by drilling 5" deep holes and grouting the same using Cement + Polymer paste.

d. Coat the cleaned old steel & the new steel also using a coating of Cement: Polymer slurry.

e. Provide necessary formwork, so as to cast a Chhajja / slab of minimum 3" thick, using cementitious mortar in the proportion of **C:S:M :: 1:11/2:3**

f. De-mould the formwork and carry out proper curing of the built up member by keeping the same continuously moist with the help of a wet cloth.

Note: Steel details will be provided on site.

Note: - Measurement for this item will be on per Sq. Ft. basis. Measurement for steel will be extra on actual weight.

12. RECASTING OF DAMAGED R.C.C. PARDIES:

a. Remove all the loose and damaged concrete from the RCC pardies.

b. Clean all the exposed reinforcement steel using rusticide.

c. Provide additional 8mm ϕ steel wherever directed with proper lap length, by tying the new steel to the old steel with binding wire.

d. Coat the cleaned old steel & the new steel also using a coating of Cement: Polymer slurry.

e. Provide necessary formwork, so as to cast a pardi of minimum 3" thick, using cementitious mortar in the proportion of site mix **C: S: M: 1:1.5:3 or R.M.C. of grade M20.**

f. De-mould the formwork and carry out proper curing of the built up member by keeping the same continuously moist with the help of a wet cloth.

g. Note: Steel details will be provided onsite.

13. BRICK MASONARY WORK

a) Bricks shall conform to the relevant Indian Standards. They shall be sound, hard, homogenous in texture, well burnt, table molded, deep red, cherry or copper colored, of regular shape and size and shall have sharp and square edges and parallel faces. They shall not absorb water more than sharp and square edges and parallel faces. They shall not absorb water more than $1/6^{th}$ of their weight when

soaked in water for more than 24 hours. Bricks shall have a minimum crushing strength of 50 kg /Sq. cm unless otherwise Noted in the drawings. The classes and quality of bricks shall be as laid down in IS: 1077. If demanded, brick samples may be got tested as per IS: 3495.

b) Mortar for brick masonry shall be prepared as per IS: 2250. The sand shall be free form clay, shale, loam, alkali and organic matter. If required the sand shall be washed till it is free of any contamination. The mortar once prepared shall be used within 45 minutes of mixing. Mortar left unused in the specified period shall be rejected.

c) All bricks shall be thoroughly soaked in clean water for at least one hour immediately before being laid. Brick work 230 mm and over shall be laid in English Bond unless otherwise specified. 115 mm brickwork shall be laid with stretchers. Brick shall be laid with frogs uppermost. All brickwork shall be plumb, square and true to dimension shown. Vertical joints in alternate courses shall come directly one over the other and be in line Horizontal courses shall be leveled.

d) Workmanship shall conform to IS: 2212.
Bricks shall be so laid that all joints are well filled with mother. The thickness of joints shall not be less than 6 mm and not more than 10 mm. The face joints shall be raked to a minimum depth of 12 mm when then mortar is still green, so as to provide a proper key for the plaster or pointing to be done.

14 CONSTRUCTING NEW BRICK MASONARY WALL

a. Soak the bricks to be used for brickwork in water thoroughly for at least 4/5hours.

b. The mortar for laying should be of **C: S: 1:5.**

c. Build the wall with one face true to plumb, using full bricks only, taking care to see that the mortar joints do not exceed 1cm in thickness.

d. For partition walls of 4.5 inches, provide a PCC course at about 4'height.

Note: - All the brickwork should be carried out in stages of 4' high, with a minimum time gap of at least 12 hours.

D PLASTER WORK

1 EXTERNAL SAND FACE PLASTER ON BRICK MASONRY WALLS

a. Carefully break the damaged plaster preferably using an Electric breaker of BOSCH Make (GSH 4) or equivalent & chisel & hammer after properly covering the openings with6
mm ply (This item will be quoted separately on Sq.ft. basis) & tying a screen of hessian cloth to ensure that the flying debris does not damage any property. The collected debris should be removed from site on a regular basis to avoid inconvenience to the members.

b. Remove the existing tree growth uprooting it up to the root & carry out acid treatment to avoid any future growth. (This item will be quoted separately on Lump sum basis)

c. Treat the separation cracks between RCC members & brickwork, wherever directed bytheconsultant,byrakingopenthecracksinVgroove&fillingthecrackswith1:2
C.M. using 3 mm down sand, with ICWPA @ as per the manufacturer's specification. This mortar should be pressed firmly in the gap by manual hand pressure and then troweled firmly and scratched, to receive the plaster. (This item will be quoted separately on R. ft. basis.)

d. Carry out proper surface preparation prior to starting the plasterwork, by soaking the brick walls completely with water, so that the walls are ready to receive the mortar.

e. Check out the plumb level of the walls by making proper level markings (Dhadas) on the walls. In case the wall is highly out of plumb, then ensure that proper plumb is maintained by operating a leveling dash coat of plaster, wherever directed by the consultant only.

f. Provide & apply first coat of Cement Sand Plaster (1:4) with addition of ICWPA compound @ as per the manufacturer's specification. Mixing should be strictly carried out in ½ bag mortar mixer & the mixed mortar should be unloaded in a plaster tray. This coat should be firmly pressed in uniform plain & in proper plumb & to be roughened to receive second coat of plaster. After the first coat is cured thrice for 7 days, a second coat of Cement Sand Plaster in C.M. 1:4 with addition of ICWPA compound @ 2% by weight of cement, should be applied on the existing first coat. The surface is to be firmly sponge floated to remove the excess moisture & to bring the sand to the surface. The finished surface should have an uniform texture. The finished surface should be properly cured thrice for 7 days to avoid occurrence of cracks.

NOTE:-Please ensure that steel trowels are not at all used for the plasterwork, as this tends to cause a lot of undulations in the finishing of the plaster.

NOTE:- Depending upon the final decision Polypropylene Fibers will be added to the Sand

: Cement mortar.

Note:- All sand used for the plaster work shall be river sand only.

2 EXTERNAL SANDFACE PLASTER ON CEMENT CONCRETE BLOCKS / RCC WALLS

a. Erect safe & strong double bamboo scaffolding so as not to make any holes in the existing structure.

b. Carefully break the damaged plaster preferably using an Electric breaker of BOSCH Make (GSH 4) or equivalent & chisel & hammer after properly covering the openings with6mm ply (This item will be quoted separately on Sq.ft basis) & tying a screen of hessian.

Cloth to ensure that the flying debris does not damage any property. The collected debris should be removed from site on a regular basis to avoid inconvenience to the members.

c. Remove the existing tree growth uprooting it up to the root & carry out acid treatment to avoid any future growth.

d. Treat the separation cracks between RCC members & concrete blockwork / RCC walls, wherever directed by the consultant, by raking open the cracks in V groove & filling the cracks with 1:2 C.M. using 3 mm down sand, with ICWPA @ 4.0% of the cement content. This mortar should be pressed firmly in the gap by manual hand pressure and then troweled firmly and scratched, to receive the plaster.

e. Carry out proper surface preparation prior to starting the plasterwork, by carrying out a very thin spray coat of 1:3 C.M. using 3mm down sand with ICWPA. This spray coat is done as an alternative to the conventional cement slurry that is used for bonding of the plaster mortar to the concrete blocks / RCC walls. This coat should be carried out at least 2 days in advance to the work of plastering, and cured properly. This wall should then be dampened by soaking the wall completely with water, at every 4 hours interval, so that the wall is ready to receive the mortar.

f. Check out the plumb level of the walls by making proper level markings (Dhadas) on the walls. In case the wall is highly out of plumb, then ensure that proper plumb is maintained by operating a leveling dash coat of plaster, wherever directed by the consultant only.

g. Provide & apply first coat of Cement Sand Plaster (1:4) with addition of ICWPA compound @ as per the manufacturer's specification. Mixing should be strictly carried out in ½ bag mortar mixer & the mixed mortar should be unloaded in a plaster tray. This coat should be firmly pressed in uniform plain & in proper plumb & to be roughened to receive second coat of plaster. After the first coat is cured thrice for 7 days, a second coat of Cement Sand Plaster in C.M. 1:4 with addition of ICWPA compound @ 2% by weight of cement, should be applied on the existing first coat. The surface is to be firmly sponge floated to remove the excess moisture & to bring the sand to the surface. The finished surface should have a uniform texture. The finished surface should be properly cured thrice for 7 days to avoid occurrence of cracks.

NOTE:-Please ensure that steel trowels are not at all used for the plasterwork, as this tends to cause a lot of undulations in the finishing of the plaster.

NOTE:- Depending upon the final decision Polypropylene Fibers will be added to the Sand : Cement mortar.

3 GAP FILLING BETWEEN RCC MEMBERS & BRICK WORK

a. Rake the joint between the RCC members and brickwork / block work in a proper V groove and remove all the loose mortar.

b. Fill the joint properly with 1:2 C: M, containing ICWPA @ 4.0% of the cement content. This mortar should be pressed firmly in the gap by manual hand pressure.

c. Embedmetalno.1&2properlyinthemortar&thentrowelthesamefirmlyand
Scratch to receive the plaster.

d. Cure this mortar properly.

4 LEVELING COAT (DASH COAT) OFPLASTER

a. Wherever instructed by the consultant, provide a dash coat of plaster, of up to 1.5" thickness in **1:3 C.M.** with ICWPA, embedding small brick pieces in it so as to bring the uneven surface in level.

b. Cure this dash coat at least thrice **for** minimum 5days**.**

1. SMOOTH (Wall putty/P.O.P) FINISH PLASTER TO THE INTERNAL STAIRCASE AREAS AND TO INTERNAL STRUCTURAL MEMBERS OF EACH FLOORS.

a. Erect safe & strong bamboo scaffolding wherever required in the staircase areas so as not to make any holes in the existing structure.

b. Carefully break the damaged plaster using chisel & hammer. The collected debris should be removed from site on a regular basis, and daily cleaning is to be carried out to avoid inconvenience to the members.

c. Mixing of mortar should be strictly carried out in plaster trays to avoid damage to the flooring.

d. Treat the separation cracks between RCC members & brickwork by opening the cracks in V groove & filling the cracks with 1:2 C.M. using 3 mm down sand, with ICWPA @ 4.0% of the cement content.

e. Provide & apply single coat of Cement Sand Plaster (1:4) with addition of ICWPA compound @ 2% by weight of cement. This coat should be firmly pressed in uniform plain & in proper plumb & finished with smooth finish, using either wall putty **or** P.O.P**.**

E. ANTI TERMITETREATMENT

A comprehensive treatment around the building in the mounds and soil to create a chemical barrier between the ground from where the termites come and woodwork and other cellulose materials in the building

The treatment shall conform to the following.

IS: 6313 (Part I), 1971- Anti-termite measures in buildings

IS: 6313 (Part II), 1971- Pre-constructional chemicalTreatmentMeasures.

IS: 6313 (Part III), 1971- Treatment for existing structures

The measurement for payment shall be the plinth area of all the building but will include for treatment to all doors, windows, battens and other wood work coming within the entire building. Contractor shall be a member of National Pest control Association.

F. PLUMBINGWORK

1 PROVISION OF TEMPORARY PLUMBINGLINES

a. Remove the existing A.C. / C.I. drain pipes &fittings.

b. Provide & lay in place temporary PVC drain pipes & PVC fittings of approved make, in proper line & level with proper spacers so as to locate the lines at least 2' away from the wall.

2 REPLACEMENTS OF DRAIN LINES (P.V.C. PIPES &FITTINGS)

a. Remove the temporary drain pipes &fittings.

b. Replace with the new **P.V.C drain pipes & fittings** of approved make, in proper line & level with proper spacers so as to locate the lines at least 2" away from the wall.

c. Seal the joints properly with rubber solution.

NOTE:- The G. I. Brackets to be provided so as to locate the lines at least 2" away from the wall. No separate charges will be paid for the M. S. Brackets.

3 REMOVAL & REFIXING OF OLD C.I. DRAINLINES

B) C. I.PIPE

The cast iron pipes shall conform to IS: 1536, 1967, IS: 1537, 1960. All fittings shall conform to IS: 1538-1969.

The socket shall be inlet end for soil or waste pipes. In vent pipes the socket shall face up

. The spigot shall be carefully centered in the socket using laps of spun hemp yarn twisted into ropes of uniform thickness thoroughly soaked in hot coal tar bitumen and dried before use. The hemp rope shall be well caulked into the back of the socket to leave sufficient depth for lead or cement mortar with fillet as the case may be. The exposed pipes shall be coated with one coat of red lead and two of good anticorrosive oil paint of approved shade.

a. Remove the temporary drain pipes &fittings.

b. Clean & re fix the last 10' of the pipe with the old C.I. Line.

NOTE: - The M. S. Brackets to be provided so as to locate the lines at least 2" away from the wall. No separate charges will be paid for the G.I. Brackets.

5 SALT GLAZEDPIPES

These shall conform to IS: 651, 1971. Jointing shall generally be done as per clause 5.6 of Is 1742, 1972, Spun yarn soaked in cement wash shall be passed round the spigot and then inserted into the socket. After caulking cement moratr1:1 shall be pressed into the joints and finished at 450. The pipes shall be laid on an even bed of 1:4:8 cement concrete with perfect gradient.

6 REMOVAL & REPLACEMENT OF NEW PVC DRAINLINES

a. Remove the temporary drain pipes &fittings.

b. Replace the last 10' of the pipe with the new PVC Line.

NOTE: - The G. I. Brackets to be provided so as to locate the lines at least 2" away from the wall. No separate charges will be paid for the G.I. Brackets.

7 KI TEC WATER SUPPLYPIPES

Pipes having H.D.P.E. on both sides & aluminum sandwich layer in between with self-pressing fittings with brass in between shall be used for loop & down take with spring bending as per manufacturer specification.

8 REPLACEMENT OF WATER SUPPLYPLUMBING

A) KI-TEC COMPOSITE PE- AL-PE PIPES WATER SUPPLY PIPE

a. Dismantle all the existing G.I. plumbing lines of various diameters including fittings.

b. Replace the same with new composite pipes & fittings of approved make using proper spacers so as to locate the lines at least 2" away from the wall.

Note: - The replacing of old lines by new lines should be done in such a manner that it causes the least inconvenience to the members.

9 CLEANING AND REFIXING OF G.I.PLUMBING

a. Dismantle all the existing G.I. plumbing lines of various diameters including fittings.

b. Clean the lines thoroughly, using mechanical means or manual means as well as acid treatment.

c. Re fix the same cleaned G.I lines &Replace the fittings with new fittings of approved make, using proper spacers so as to locate the lines at least 2" away from the wall.

NOTE: - his item will be measured in terms of R.ft.

NOTE: - The G. I. Brackets to be provided so as to locate the lines at least 2" away from the wall. No separate charges will be paid for the G.I. Brackets.

10 REPLACEMENT OF G.I. CONNECTORPIECES

a. Remove all the existing Horizontal G.I. Connector pieces (Barrel Nipples) of ½",¾" , 1", 11/4" and 11/2" dia connector pipes.

b. Replace the corroded & damaged Barrel Nipples (Wall Pieces) with C Class pipes and with PVC Sleeves, by making appropriate holes, making required connections, testing & refilling the holes to match with the plastered surface.

Note:- The rate for this item will also include the cost of the re fixing of only the tiles inside the flat, which were broken as a result of this replacement. IN OTHER CASE OF STANDARD WHITE/COLOR 6" X 6" TILES, THE CONTRACTOR WILL SUPPLY & FIX THE SAME AT HIS OWN COST.

11 P & F NEW GATEVALVES.

a. Provide and fix in place new Gate Valves made up of Gun Metal of ISI marking.

12 UNDERGROUND DRAINAGELINES

a. Excavate a trench in any kind of soil to minimum width of 4'to enable proper laying of the SW Pipes. Proper shoring / shuttering to be carried out wherever required.

b. Lay 4" thick PCC (1:3:6) in a proper gradient of 1" per 10', over proper rubble soling, to form

a firm base for the SW Pipes.

c. Lay SW Pipes over the PCC and fill the joints properly with (1:2) cement: sand mortar and check the line for leakages if any.

d. Inspection chambers to be provided at appropriate intervals as directed.

e. Lay 3" thick PCC (1:3:6) over the pipes so as to encase these pipes.

f. Backfill the entire trench with murum soil with proper compaction & cart away the extra soil / murum& clean the entire area.

13 INSPECTIONCHAMBERS

a. Excavate a trench in any kind of soil to minimum dimensions of 4'x2'.

b. Lay 4" thick PCC (1:3:6) over proper rubble soling, to form a firm base for the Inspection chambers. Construct an inspection chamber in 9" thick brickwork in 1:5 cement: sand mortar. Finish the same with neat cement finish from inside & top. Provide sand faced finish from outside, with the provision of a proper culvert at the bottom.

c. After proper curing, fix a new RCC cover, of approved make.

14 GULLYTRAP

a. Excavate a trench in any kind of soil to minimum dimensions of 2'x2'.

b. Lay 4" thick PCC (1:3:6) over proper rubble soling, to form a firm base for the Gully trap.

c. Fix a proper SW Gully trap & connect the same to the SW line. Construct an inspectionchamberin4"thickbrickworkin1:5cement:sandmortararoundthegully trap. Finish the same with neat cement finish from inside & top.

d. After proper curing, fix a new **Cast Iron** cover, of approved make.

15 MANHOLE CHAMBERS

a. Excavate a round trench in any kind of soil to minimum depth of 8' and dia. of5'.

b. Lay 4" thick PCC (1:3:6) over proper rubble soling, to form a firm base for the Manhole chamber.

c. Construct a round manhole chamber in 9" thick brickwork in 1:5 cement: sand mortar in the form of an inverted cone. Finish the same with neat cement finish from inside & top. Provide sand faced finish from outside.

d. Fix a new frame fabricated from 5mm thick M.S. angles of 40mm x 40mm size, to encase the RCC lid, and finish the top area of the chamber with IPS finish.

e. After proper curing, fix a new RCC cover, of approved make.

f. Apply one coat of **SYNTHETIC PLASTER** as per the manufacturer's specifications, to the entire dead wall of the building, as directed by the consultant.

g. Clean the glasses of windowpanes & untie the scaffolding.

H. MISCELLANEOUS ITEMS / ADDITIONALITEM

1 PLINTHPROTECTION

a. Wherever necessary, excavate the sub soil to proper depth & 3' width around the periphery of the building & carry out ramming to compact the subsoil.

b. Provide & lay in place 9" thick rubble soling & fill the interstices with glass pieces & stone chips in order to fill the voids & compact the same.

c. Provide & lay in place average 4" thick & 3' wide 1:2:4 PCC using proper form work & compact with proper line level including broom finish & curing etc. complete.

2 DAMP PROOFCOURSE

Damp proof course shall be approved at positions shown on the drawings or wherever indicated by the Engineer. In Masonry walls it shall normally be placed above the external ground level at positions specified by the Engineer. The brick or stone masonry shall be leveled and prepared to receive the damp- proof course.

Damp proof course shall mean a layer of cement concrete 1:2:4 with approved waterproofing compound and of a specified thickness. The top surface is covered with two generous coats of tar or bitumen of approved make and the surface then sprinkled with fine sand. All exposed surface of the damp- proof course shall be finished fair and smooth.

A) Damp proof course:

Damp proof course shall be approved at positions shown on the drawings or wherever indicated by the Engineer. In Masonry walls it shall normally be placed above the external ground level at positions specified by the Engineer. The brick or stone masonry shall be leveled and prepared to receive the damp- proof course.

Damp proof course shall mean a layer of cement concrete 1:2:4 with approved waterproofing compound and of a specified thickness. The top surface is covered with two generous coats of tar or bitumen of approved make and the surface then sprinkled with fine sand. All exposed surface of the damp- proof course shall be finished fair and smooth.

3PAVING WITH PCC

a. Excavate the existing paving along with sub soil to proper depth & carry out ramming to compact the subsoil.

b. Provide & lay in place 9" thick rubble soling & fill the interstices with glass pieces & stone chips in order to fill the voids & compact the same.

c. Provide & lay in place average 4" thick 1:2:4 PCC using proper form work & compact with proper line level including broom finish & curing etc. complete.

d. Excavate the existing paving along with sub soil to proper depth & carry out ramming to compact the subsoil.

e. Provide & lay in place 9" thick rubble soling & fill the interstices with glass pieces & stone chips in order to fill the voids & compact the same.

f. Provide & lay in place average 4" thick 1:2:4 PCC using proper form work & compact with proper line level including broom finish & curing etc. complete.

4 REMOVING VEGETATION PLANTATIONS

a. Remove the vegetation / plantation which has grown in the plumbing duct areas.
b. The roots should be removed totally and the area should be treated properly with a solution of Asafetida (**HING**) or 30% HCl acid & Calcium Carbonated concentrated solution as suggested by NIC.

5 REPLACEMENTS OF LOUVERED WINDOWS OF BATHROOMS /W.C

a. Remove the existing wooden windows of the W.C. /Bathrooms.
b. Carry out framing of the edges with 1' wide marble.
c. Fix new adjustable Aluminum louvered windows using heavy aluminum section.
d. Fix new glasses of 5mmthickness.
e. Fix new M.S Grills, within the marble frame.

6. PROVIDING NEW REINFORCEMENT

a. Provide & fix in place new reinforcement of appropriate dimensions, as per the instructions to be provided at site, at appropriate times.
b. The new reinforcement should be tied to the existing reinforcement using binding wire.

7 WATERPROOF COATING

a. Provide and apply two coats of slurry of Polymer: Cement (1:1.5), at any place indicated by the consultant.

b. The first coat and the second coat should be applied at directions perpendicular to each other.

8 ELASTOMERIC PAINT:

Film thickness of 125 micron+ shall be achieved in two coats with a coat of primer by brush with water addition as per manufacturer specifications. Approved shade & make shall be taken in writing from client as per consultant's recommendation. Joint Warranty for 07 years shall be provided in specified format for no seepages from walls & area attended. Base of paint must be 100% acrylic.

Formulations containing styrene butadiene rubber will not be allowed for use on external surfaces. Minimum crack bridging capacity expected is up to 1 mm.

STONE FINSIH TEXTURE

Stone finish is a high-build acrylic texture & coating system trowel-applied to give a stucco-like 2mm texture which will be available in single and multi colour systems. Trowel applied to give a stone-like 2mm texture which will be available in single and multi-colour systems. These finishes may be over coated with water based or solvent free PU clear lacquer. THE STONE LIKE ANCIENT LOOK ALONGWITH ITS STURDY LOOK IS THE HIGHLIGHT OF THE PRODUCT.

- These Texture finishes will give maximum water proofing to the structure because of its coating system.
- Stone finish is a convenient system for creating a protective and aesthetically pleasing texture finish for most cementitious substrates.
- This offers a choice of finishes which may be left in a matt texture or over coated by a clear lacquer.
- Being a spray applied texture or trowel applied finish, this allows some degree of inconsistency in the substrate texture and is readily suited to touch up both features resulting in savings of time and labour.
- This finish has a proven track record over many years of resisting extreme of weathering conditions.
- These finishes are water-based for applicator safety and ease of use.
- To achieve indicated performance, surface preparation must be carried out according to the company recommendations.
- The surface must be free from dust, dirt, grease, oil and other contaminants that may interfere with adhesion.
- Fresh cementitious substrates should be left for 14 days before coating.

- These finishes will be available in single and multi-colour systems. These finishes will minimize the degree of surface preparation required and allows some surface imperfections to be filled.

Property	Value
Adhesion on plaster/concrete	Excellent
Wash ability	Water Resistance and Washable
Moisture Control	Excellent, however the coating must not be subjected to hydraulic pressure
Abrasion Resistance	Excellent
Tensile Strength	Excellent
Semi Magic Resistance	Very High
Biological Resistance	Resistance to algae and Fungal growth
Property	Value
Coating System	2 / 3 Coat System
Colour	Available in large variety of shades
Application	By spray and Trowel
Film Thickness	2.00 to 2.50 mm
Surface Dry	12 to 24 Hrs.
Re-Coat	After 24 Hrs.
Hard Dry	7 Days.
Packing	30 Kgs. HDPE bag packing.
Material Density	1.6 - 1.8 Kg,/Ltr.
Consistency	Thick Paste
Solid Contains	80 (+-) 2 %

pH Value	8 to 9
Texture	Depending on the spray or Trowel Techniques.
Gloss Level	Depending on the top coat.
Coverage	3 - 4 sq. ft. per kg per coat
Shelf Life	3 months if stored appropriately under cover, above ground, away from direct heat and moisture and in well-sealed containers

9 TEXTURE LAYER 2 MMTHICK

Over finished external surface, trowel applied layer containing white cement binder, quartz silica grains with powder polymer shall be applied in approved finish & shall be painted in two coats of acrylic premium paint of approved shade & make. 10 years warranty shall be provided for no peel off, leakages or cracking of product.

Tie necessary bamboo scaffolding & clean the entire sand face plaster on the dead walls thoroughly using wire brushes in dry condition.
Wash the cleaned surface with water. Scrub the entire surface thoroughly using wire brushes once again but with running water.
Fill the deep grooves provided in the dead wall with the same SYNTHETIC PALSTER material.
Apply one coat of **SYNTHETIC PLASTER** as per the manufacturer's specifications, to the entire dead wall of the building, as directed by the consultant.
Clean the glasses of windowpanes & untie the scaffolding.

10. EXCAVATION

a. Carry out excavation in any subsoil up to a depth of 5 feet, including carting away the excavated material.

b. Backfill the excavated area using the same material.

11 GROUTING

A. P & F MARBLE FRAMES FOR WINDOWS /DOORS.

a. Remove the existing wooden frames of windows / doors along with their holdfasts.

b. Repair the damaged brickwork and fill up the holes & voids if any with Cement: Sand mortar.

c. Fix a new frame in marble, with a proper step, for fixing of windows / doors, with proper line, level &finishing.

B. CRACK FILLING IN THE WALLPLASTER.

a. Open up all the visible cracks in the plaster, in a V groove fashion using an electric cutter machine.

b. These cracks may be used with ready mix crack filling acrylic paste made by Perma Roffe/Chryso/approved brand

c. Finish the same so as to ensure that the filled crack matches the level of the plaster.

C. FIXING SPOUT PIPES IN BOX TYPE CHAJJAS/BALCONY.

a. Make **two** necessary holes of 50 mm in the flower beds using proper electric hammer drill

b. Fix **two** new nipples of 40 mm using PVC pipes using neat cement for proper anchorage.

c. Seal the holes properly after the spout pipes have been fixed.

ELECTRICAL SYSTEM WORK:-

TECHNICAL SPECIFICATIONS INTERNAL ELECTRICAL WORKS

Internal & External electrical works will be carried out as per CPWD specifications and will be paid accordingly.

A. CABLES

MEDIUM VOLTAGE 1.1 kV GRADE XLPE INSULATED / PVC INSULATED CABLES

1. GENERAL

The MV cables shall be supplied, inspected, laid, tested and commissioned in accordance with drawings, Specifications, relevant Indian Standard and cable manufacturer's instruction.

2. MATERIAL

Specifications of PVC insulated, sheathed aluminum / copper conductor cable shall be as follows:

a. Conductor

Stranded compacted circular conductor shall be of electrical grade high conductivity aluminum/ copper conductor as per IS: 8130 / 84.

b. Insulation

The insulation shall be compounded PVC, application shall be by extrusion process insulation type C (85deg.C) conforming to IS: 5831-1984. The thickness of insulation will be as per the relevant Indian codes.

c. Laying-up

Insulated conductors of multi core cables shall be with thermoplastic fillers in the interstices. The phase identification of cores shall be by colored strips.

d. Inner Sheath

Cores shall be surrounded either by a wrapped or an extruded PVC sheath. The thickness of the inner sheath shall be as per relevant Indian codes.

e. Armouring

The armouring shall be provided over the inner sheath. Single core cable shall have non-magnetic armouring. Multi core cables shall have either galvanized round steel wires or flat steel strip armouing. Steel wires and strips for armouring confirm to IS: 3975. The direction of lay of armouring shall be opposite to that of cores.

f. Outer Sheath

Single and multi core cables are provided with an extruded PVC outer-sheath. The thickness of the sheath shall be as per IS: 1554-1988. The PVC compound for the outer-sheath shall confirm to Type ST1 of IS 5831. The colour of the outer sheath shall be black.

3. Specifications for XLPE insulated HR PVC sheathed aluminum / copper conductor cable shall be as follows:

a. Conductor

Stranded compacted circular conductor shall be of electrical grade high conductivity aluminum / copper conductor per IS: 8130/84.

b. Insulation

The insulation shall be of natural unfilled chemically cross linked polyethylene conforming to IS: 7098. The thickness of insulation shall be as per the relevant Indian codes.

c. Laying-up

Insulated conductors of multi core cables shall be with plastic fiber in the interstices. The phase identification of cores shall be by colored strips.

d. Inner Sheath

The cores shall be surrounded by either a wrapped or by an extruded PVC sheath. The thickness of the inner sheath shall be as indicated in the relevant codes.

e. Armouring

The armouring shall be provided over the inner sheath. Single core cable shall have non-magnetic armouring. Multi core cables shall have either galvanized round steel wires or flat steel strip. Steel wires and strips for armouring confirm to IS: 3975. The direction of lay of armouring shall be opposite to that of cores.

f. Outer Sheath

Single and multi core cables are provided with an extruded PVC outer-sheath. The thickness of the sheath shall be as per IS: 1554-1988. The PVC compound for the outer-sheath shall confirm to Type ST2 of IS: 5831. The colour of the outer sheath shall be black.

4. CABLE LAYING AND HANDLING

It should be ensured that both ends of the cable are properly sealed to prevent ingress / absorption of moisture.

5. CABLE HANDLING

When cable drums have to be moved over short distance, they should be rolled in the direction of the arrow marked on the drum.

While removing cables, the drums shall be properly mounted on jacks or on a cable wheels or any other suitable means, making sure the spindle, jack etc. are strong enough to take the weight of the drum.

The cables shall not be given a sharp bend to a small radius. The minimum safe bending radius for all types of PVC/XLPE 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 a multicore cable shall not be less than 15 times its overall diameter.

Cable with kinks and straightened kinks, or with similar apparent defects like defective armoring etc. shall not be installed / laid.

Cables of different voltages as well as power and control cables should be kept in different trenches/racks with adequate separation. Where available space is restricted, LV/MV cable shall be laid above HV cables.

Where cables cross over cannot be avoided, the cable of higher voltage shall be laid at a lower level than the cable of lower voltage.

Installation of cables including jointing shall be carried out as per IS: 1255 amended and revised to date.

Power and communication cables shall, as far as possible cross at right angles. Where power cables are laid in proximity to communication cables, the horizontal and vertical clearances shall not normally be less than 60 cm.

Cables shall be laid direct in ground, in pipes / closed ducts, in open ducts or on surface depending on environmental conditions, and as required in schedule of quantities.

During the preliminary stages of laying the cable, consideration should be given to proper location of the joint position so that when the cable is actually laid, the joints are made in the most suitable places and as approved by Consultant. As far as possible, water logged locations, carriage ways, pavements, proximity to telephone cables, gas or water mains, inaccessible places, ducts, pipes, racks, etc. shall be avoided.

The cable shall not in any circumstances be bent so as to form an abrupt right angle but must be rounded off at the corners to a radius not less than 12 times the overall diameter of the cable.
In case, where there are chances of any damage to the wiring/cables, such wiring/cables shall be covered with a sheet metal protective covering (not less than 16 SWG), the base of the covering being flush with the plaster or brickwork as the case may be, or the wiring /cables shall be drawn through a heavy gauge metal conduit pipe by complying with all the requirements of conduit wiring system.

Such protective covering shall, in all cases, be fitted on all down drops within 1.5 m from the floor or from floor level upto the switch board, whichever is less.

While cutting and stripping of the outer sheathing of the cable, care shall be taken that the sharp edge of the cutting instrument does not touch the inner insulation of the conductors. The protective outer covering of the cable shall be stripped off near connecting terminal and this protective covering shall be maintained upto close proximity of connecting terminals. The cables laid near junction boxes shall be made moisture proof with a plastic compound.

6. CABLE JOINTING & TERMINATION

Jointing shall be as per the manufacturer’s recommendations using standard kits. Cable joints shall be

made in suitable, approved cable joint boxes, jointing of cables in the joint boxes and filling of compound shall be done as per manufacturer's recommendations. Heat shrinkable joints shall be made.

Cables shall be terminated onto the terminals of switchgear through crimping lugs of proper size and of heavy duty. Cable lugs shall be fitted onto the cable by crimping or compression jointing. Continuity of cable armouring is to be maintained. Double compression glands to be used. Proper crimping tools to be used.

7. TRENCHING & CABLE LAYING

The minimum width of trench shall be 45 cm and depth shall be 75cm for laying of cable. Where more than one cable is to be laid in the same trench in horizontal formation, the width of trench shall be increased such that the minimum gap between the cables is one diameter of the cable unless specified otherwise.

The clearance between axis of the end cables and the sides of the trench shall be minimum 1.5 D (diameter) of the end cable.

The trenches shall be excavated in reasonably straight lines. Wherever there is a change in direction, suitable curvature shall be provided.

Where gradients and changes in depth are unavoidable, these shall be gradual.
The bottom of the trenches shall be level and free from stone, brick bats etc. The trench shall then be provided with a layer of clean, dry sand cushion of not less than 9 cm in depth.
Cable laid in trenches in a single tier formation shall have a covering of clean, dry sand of not less than 20 cms. above the base cushion of sand before the protective cover is laid.
In the case of vertical multi-tier formation, after the first cable has been laid, a sand cushion of 30 cms shall be provided over the initial bed before second tier is laid. If additional tiers are formed, each of the subsequent tiers shall have a sand cushion of 30 cms as stated above. The top-most cable shall have final sand covering not less than 17 cms before the protective cover is laid.
Unless otherwise specified, the cables shall be protected by second class bricks of not less than 20 cm x 10 cm x 10 cm (nominal size) as per CPWD building specification, or protection covers placed on top of the sand, (brick to be laid breadth wise) for the full length of the cable to satisfaction of the owner. 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 5 cm over the sides of and cables.

The trenches shall be then back filled with excavated earth free from stone or other sharp-edged debris and shall be rammed and watered, if necessary, in successive layers not exceeding 30 cm. Unless otherwise specified, a crown of earth not less than 50 mm in the center and tapering towards the sides of the trench shall be left to allow for subsidence. The crown of earth, however, should not exceed 10 cms.

Where road bends or lawns have been cut or kerb stones displaced, the same shall be repaired to the satisfaction of the architect and all surplus earth or rock removed to places as specified.
In locations such as road crossing, entry to building in paved areas etc. cables shall be laid in pipes or closed ducts.

All cable entry/exit points into the building through pipe sleeves shall be properly sealed with water and fire safe sealants in an approved manner to avoid any seepage of water into the building.

Manholes of adequate size, as decided by the Architect, shall be provided to facilitate of adequate strength feeding/drawing in of cables and to provide working space for persons. Suitable manhole covers with frame of proper design shall cover Manholes.

CABLE LOOPS: Sufficient cable loop length shall be left.

8. CABLES ON HANGERS OR RACKS / TRAYS

The contractor shall provide and install all iron hangers racks, or racks with die-cast cleat, with fixing rag bolts or girder clamps or other specialist fixing as required.

Where hangers or racks are to be fixed to wall sides ceiling and other concrete structures, the contractor shall be responsible for cutting away, fixing and grouting in rag bolts and making good the damages as required.

The hangers or racks shall be designed to leave at least 25 mm clearance between the cables and the face to which it fixed. Multiple hangers shall have two or more fixing holes. All cables shall be saddled at not more than 500 mm intervals. These shall be designed to keep provision of some spare capacity for future development. Minimum spacing between the cables shall be one diameter of the cable or as specified.
Page 49 / 104

9. CABLE TRAY

a) The MS cable trays should have undergone rigorous rust proofing process, which should comprise of alkaline, degreasing, descaling in diluted sulpharic acid and a recognized phosphating process. The sheet work shall then be given two coats of oxide primer before two coats of final painting. Cable trays shall be either painted (Stove enameled) or hot dip galvanized as called for in the schedule of quantities.

b) Cable trays shall be complete with bends, joints, coupler plates and accessories as may be required for joining the cable trays.

c) Cable trays shall be either perforated or ladder type as called for in the schedule of quantities.

10. PERFORATED CABLE TRAYS

Standard Technical details of perforated cable tray shall be as follows:

S. No.	Description Thickness
1.	150mm to 450mm width 2mm thick & 40mm collar
2.	600mm to 750mm width 2mm thick & 50mm collar
3.	900mm to 1200mm width 3mm thick & 75mm collar

Minimum 10mm dia GI rod suspender shall be used @ 1500mm intervals.

11. LADDER TYPE CABLE TRAYS

Standard technical details of ladder type cable trays shall be as follows:

S. No.	SIZE OF TRAY(Width)	SIZE OF MAIN CHANNEL SIZE OF RUNG & SPACING BETWEEN RUNGS	SIZE OF ANGLE FOR SUPPORT
1.	900mm to 1500mm	25 x100 x 25 x 3mm @ 250C/C	20 x 50 x 20 x 3mm 50x50x5mm @150mm C/C
2.	600mm to 750mm	25 x 75 x 25 x 2.5mm @ 250C/C	20 x 40 x 20 x 2.5mm 40X40x5mm

@180mm C/C

3. 150mm to 450mm 5 x 75 x 25 x 2mm 20 x 30 x 20 x 2.5mm

@ 250C/C

32X32x4mm

@180mm C/C

Fixing arrangement shall be as approved by the Consultant / Owner / PMC

Hardware to be used in cable tray system shall be galvanized or zinc passivated.

a. Quality of Zinc

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

b. Coating Requirement

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

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

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

Page 50 / 104

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

12. TESTING OF CABLES

The Meggar value in normal dry weather shall be 50 mega ohm for 1.1 kV grade cable. Cables shall be tested at works for the following tests before being dispatched to site by the project team:

a. Insulation Resistance Test.

b. Continuity resistance test.

c. Sheathing continuity test.

d. Earth test.(in armoured cables)

e. Hi Pot Test.

Test shall also be conducted at site for insulation between phases and between phase and earth for each length of cable, before and after jointing. On completion of cable laying work, the following tests shall be conducted in the presence of the Owner's site representative:

a. Insulation Resistance Test(Sectional and overall)

b. Continuity resistance test.

c. Sheathing continuity test.

d. Earth test.

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

13. CABLE TAGS

Cable tags shall be made out of 2mm thick aluminum sheets. Each tag shall be 2" in dia or 3" x 3" square with one hole of 2.5mm dia, 6 mm below the periphery, or as approved by Consultant. Cable designations are to be punched with letters / number punches and the tags are to be tied to cables with piano wires of approve quality & size. Tags shall be tied inside the panels beyond the glanding as well as above the glands at cable entries. Along trays tags are to be tied at all bends. On straight lengths, tags shall be provided at every 5 meters.

Cables shall be secured to cable trays with 3mm thick x 25mm wide aluminum strips/suitable GI

clamp, or as approved by Consultant, at 1000 mm intervals and screwed by means of rust proof screws, washers and bolts, of adequate but not excessive lengths. Cable trays for horizontal runs suspended from the ceiling will be supported with mild steel straps or brackets, at 1000 mm intervals and the overall tray arrangement shall be of a rigid construction. External cabling route marker with GI plate marked with “DANGER 1.1 kV CABLE” with 1 meter long GI angle iron grouting bracket including 1:3:6 ratio cement concrete base block of minimum size 200 x 200 x 350 mm to be provided or as approved by Elect. Supply Company.

B. EARTHING

1. SYSTEM OF EARTHING

The system shall be TNS with 4 wires supply system (R, Y, B, N and 2 Nos. E) brought from the main LT Panel.

All non-current carrying metal parts of the electrical installation shall be earthed as per IS: 3043 – 1987 with latest amendment. All metal conduits, cable sheath, switchgear, DBs, light fixture, equipment and all other parts made of metal shall be bonded together and connected to earth electrodes. Earthing shall be in conformity with provisions of rules 32, 61, 62, 67 and 68 of Indian Electricity Rules, 1956.

All earthing conductors shall be of high conductivity copper or GI, as specified in the schedule of quantities & shall have protection against mechanical damage. The cross-sectional area of earth conductors shall not be smaller than half that of the largest current carrying conductor.

Main earthing conductors shall be taken from the earth connections at the main L T panel to an earth electrode with which the connection is to be made. All joints in tapes shall be with four rivets and shall be brazed in case of copper and by welding bolting in case of GI. Wires shall be connected with crimping lugs, all bolts shall have spring washers. Sub- mains earthing conductors shall run from the

main distribution panel to the sub distribution panel. Final distribution panel earthing conductors shall run from sub-distribution panel.

Circuit earthing conductor shall run from the exposed metal of equipment and shall be connected to any point on the main earthing conductor, or its distribution panel. Metal conduits, cable sheathing and armouring shall be earthed at the ends adjacent to distribution panel at which they originate, or otherwise at the commencement of the run by an earthing conductor in effective electrical contact with cable sheathing. Where equipment is connected by flexible cord, all exposed metal parts of the equipment shall be earthed by means of an earthing conductor enclosed with the current carrying conductors within the flexible cord. Switches, accessories, lighting fitting etc. which are rigidly secured in effective electrical contact with a run of metallic conduit shall not be considered as a part of the earthing conductor for earthing purposes, even though the run of metallic conduit is earthed.

a. All Lighting fixtures, sockets outlets, fans, switch boxes and junction boxes etc. shall be earthed with copper wire as specified in schedule of quantities. The earth wire ends shall be connected with solderless/bottle type copper lugs.

All the earth wires in switch boxes, sockets outlets, DB's and light fixtures shall be of green Colour (PVC insulated).

Main earth bus shall be taken from the L.T. switch board to earth electrodes. The electrical resistance of earthing conductors shall be low enough to permit passage of fault current necessary to operate fuse or circuit breaker, and it shall not exceed 1 ohm.

2. SIZING OF EARTHING CONDUCTORS

The cross sectional area of earthing conductor shall not be smaller than half of the largest current carrying conductor subject to an upper limit of 80 Sq.mm. If the area of the largest current carrying conductor or bus bar exceeds 160 sq.mm then two or more earthing conductors shall be used in parallel, to provide at least half the cross sectional area of the current carrying conductor or bus bars.

All fixtures, outlet boxes, junction boxes and power circuits upto 15 amps shall be earthed with PVC insulated copper wire.

All 3 phase switches and distribution panels upto 60 amps rating shall be earthed with 2 Nos. distinct and independent 4 mm dia copper / GI wires. All 3 phase switches and distribution panels upto 100 amps rating shall be earthed with 2 Nos. distinct and independent 6 mm dia copper / GI wires. All switches, bus bar, ducts and distribution panels of rating 200 amps and above shall be earthed with minimum of 2 nos separate and independent 25 mm x 3 mm copper / GI tape.

Earthing details given in Table – A & B shall be referred to as a general guidance. Exact sizes to be worked out by the contractor as per relevant IS Codes.

Page 52 / 104

Table - A

Size of earth leads

(a) For Transformer/Generator Neutral Point Earthing:

Electrolytic Galvanized

Transformer/ Bare copper Iron

DG Set Conductor Wire Conductor wire

Rating or strip or strip

50kVA & below/4mm dia 4mm dia 25mm x 6.0mm

75 kVA 25mm x 3.0mm 25mm x 6.0mm

100 kVA 25mm x 6.0mm 32mm x 6.0mm

150 kVA 25mm x 6.0mm 40mm x 6.0mm

200 kVA 25mm x 6.0mm 40mm x 6.0mm

250 kVA 25mm x 6.0mm 40mm x 6.0mm

300 kVA 25mm x 6.0mm 40mm x 6.0mm

500 kVA 40mm x 6.0mm 40mm x 6.0mm

750 kVA 40mm x 6.0mm 50mm x 6.0mm

1000 kVA 40mm x 6.0mm 50mm x 6.0mm

1250 kVA 50mm x 6.0mm 50mm x 6.0mm

1500 kVA 50mm x 6.0mm 75mm x 6.0mm

2000 kVA 50mm x 6.0mm 75mm x 6.0mm

NOTE: - EXACT SIZE OF EARTH LEAD TO BE DETERMINED AS PER LATEST IS CODES.

TABLE – B

(b) For Equipment Earthing (Applicable to Transformer, Generators, Switchgears, Panels, DB's, Motors etc.)

Rating of Bare Electrolytic Galvanised

400-V, 3ph Copper conductor Iron Wire / Strip

50 cy. Equipment Wire / Strip

In kVA

upto 5 2mm dia 2mm dia

6 to 15 3mm dia 3mm dia

16 to 30 4mm dia 4mm dia

31 to 50 6mm dia 6mm dia

51 to 100 25mm x 3.0mm 25mm x 6.0mm

101 to 125 25mm x 3.0mm 32mm x 6.0mm

126 to 150 25mm x 3.0mm 32mm x 6.0mm

151 to 200 25mm x 6.0mm 40mm x 6.0mm

201 to 300 25mm x 6.0mm 50mm x 6.0mm

301 to 500 32mm x 6.0mm 50mm x 6.0mm

501 to 800 40mm x 6.0mm 50mm x 6.0mm

Above 800 50mm x 6.0mm 50mm x 6.0mm

NOTE: EXACT SIZE OF EARTH LEAD TO BE DETERMINED AS PER LATEST IS CODES.

NOTE: ALL THREE PHASE EQUIPMENT SHALL BE DOUBLE EARTHED

Page 53 / 104

3. PROHIBITED CONNECTIONS

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

4. CONNECTION/JOINTS

The earthing connections/joints should be bolted, riveted, welded, brazed type.

In case of bolted joints, GI/Passivated hardware's of adequate size/nos. should be used for firm connections. The minimum contact area should be equal to the width of the strip or cross-sectional area of earthing lead. Welded/brazed joints should be smooth and continues. All welded/brazed joints should be treated with anti-corrosive paints to protect it from corrosion/rusting.

All bolted connections/joints of Cu strip should be tinned.

Wherever, flexible earthing connection is must, it should be hydraulically crimped lugs of Copper/Aluminum.

The effective earthing connection surface should be smooth & free from paints and oxide coatings.

5. EARTHING

The following must always be ensured in earthing system:

All earths must be interconnected. This includes transformer neutrals, Transformer body, HT Panels, LT Panels, lightning protection system earths, UPS earths etc and provision for interconnection with

other services earthing grid etc. shall be made. All earth pits should be at equi - potential.

Extraneous conductive parts such as gas pipes, other service pipes and ducting risers and pipes of fire protection equipment and exposed metallic parts of the building structure.

The Contractor shall get the soil resistivity test done at his own cost of the area where earthing pits are to be located before starting the installation.

6. RESISTANCE TO EARTH

The resistance of earthing system shall not exceed 1 ohm.

SPECIFICATION FOR HOT DIP GALVANIZING PROCESS FOR MILD STEEL USED FOR EARTHING FOR

ELECTRICAL INSTALLATION

7. GENERAL REQUIREMENTS

a. Quality of Zinc

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

b. Coating Requirement

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

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

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

Mild steel flats / wires shall undergo a process of degreasing pickling in acid, cold rinsing and then galvanizing. Jointing of earthing tape shall be by welding. All joints and cut ends shall be properly painted with aluminum paint.

8. MAINTENANCE FREE CHEMICAL EARTHING:

Maintenance Free Chemical Earthing shall be done strictly as per manufacturer's recommendations. It shall be completely maintenance free, long life close to 25 years, environmentally safe, non corrosive & electrically conductive. The earth resistance results shall be less than one ohm.

C. MV PANELS:

1.0 GENERAL

Medium voltage power control centres (generally termed as switchboard panels) shall be in sheet steel clad cubicle pattern, free floor standing, totally enclosed, compartmentalized design having multitier arrangement of the incomers and feeders as per details given in the schedule of quantities. All panels shall conform to the requirements of the latest addition of IS and shall be suitable for 415 V, 3 phase AC supply or 230 V single phase AC supply as required. The drawing of panel mmay got approved from Engineer En-charge before placing order.

2.0 CONSTRUCTIONAL FEATURES

The Switch Boards shall be totally enclosed, sheet steel cubicle pattern, extensible on either side, dead front, floor mounting type (wall mounting if specifically asked for in BOQ) and shall have a bus bar chamber at the top and the cable entry from the bottom. (For panel requiring top cable entries if any, refer to BOQ). The cable terminations should be in side the feeder compartment only.

The Switch Boards shall be completely dust and vermin proof. Synthetic rubber gaskets between all adjacent units and beneath all covers shall be provided to render the joints dust and vermin proof to provide a degree of ingress protection of IP 43. All doors and covers shall also be fully gasketed with synthetic rubber. All the live parts shall be properly shrouded with FRP sheets.

The Switch Board shall be fabricated with CRCA Sheet Steel of thickness not less than 2.0mm and shall be folded and braced as necessary to provide a rigid support for all components. The doors and

covers shall be constructed from CRCA sheet steel of thickness not less than 1.6 mm. Joints of any kind in sheet metal shall be seam welded and all welding slag ground off and welding pits wiped smooth with plumber metal. Base channel shall be fabricated from ISMC 75 and door shall be provided at the bottom with arrangement for fixing bolts in the foundation.

All panels and door covers shall be properly fitted and square with the frame. The cutouts in the panel shall be correctly positioned.

Lifting lugs of adequate strength shall be provided on each transport section of the panels.

Fixing screws shall enter holes tapped into an adequate thickness of metal or provided with hank nuts. Self threading screws shall not be used in the construction of the Switch Boards.

3.0 SWITCHBOARD DIMENSIONAL LIMITATIONS

A base channel 75 mm x 5 mm thick shall be provided at the bottom.

The overall height of the Switch Board shall be limited to 2200 mm

The height of the operating handle, push buttons etc shall be restricted between 300 mm and 1900 mm from finished floor level.

4.0 BUS BARS

The bus bars shall be suitable for 4 wire, 415 volts, 50 Hz, system. The main bus bar shall be made of high conductivity electrolytic grade AL 91E Aluminium. The bus bars shall have uniform cross section throughout the panel. The bus bars shall be capable of carrying the rated current at 415 volts continuously. The bus bar will run in a separate busbar chamber using bus insulators made of nondeteriorating, vermin proof, non hygroscopic materials such as epoxy fiber, reinforced polyester or moulding compound (min. 25mm clearance between phase to phase & phase to neutral busbars shall be provided). The interval between the two insulators will be designed after considering the following:

a) Strength and safe load rating of the insulator,

b) The vibrating force generated during a fault,

c) A Factor of safety of 1.25

d) A set of insulators at both ends of the bus.

Bus bars shall be sized considering maximum current density of 1 Amps/ cross section Sq.mm area. The size of the bus bar calculations must be approved by the consultants. The bus bars shall be designed to withstand a temperature rise of 45oC above the ambient. To limit the temperature rise in the bus bar chamber a set of louvers can be provided at strategical places considering the air circulation.

All the bus bars shall be insulated with PVC heat shrinking sleeves throughout (except at joints) the length of the panel. The electro-galvanised high tensile steel nuts, bolts, plain or spring washers of suitable size will be used in connecting the various section of the bus bars.

5.0 SWITCH BOARD INTERCONNECTIONS

All connections between the bus bars/Breakers terminations shall be through solid Aluminium strips of adequate size to carry full rated current which shall be PVC/fibre glass insulated.

For switch unit ratings upto 63A PVC insulated copper conductor wires of adequate size to carry full load current can be used. The terminations of all such interconnections shall be properly crimped.

6.0 CABLE TERMINATIONS

Knockout holes of appropriate size and number shall be provided in the Switch Board in conformity with the location of incoming and outgoing conduits/cables. All cable entries shall be from bottom until & unless specifically asked for in the BOQ.

The cable terminations of the circuit breakers shall be brought out to terminal cable sockets suitably located in the panel.

All outgoing links for FSU\MCB feeders shall be in the feeder compartment only.

The Switch Boards shall be complete with tinned brass cable sockets, tinned brass compression glands, gland plates, supporting clamps and brackets etc for termination of 1100 volt grade aluminium conductor PVC cables.

7.0 EARTHING

The panels shall be provided with an aluminium earth bus of suitable size running through out the length of the switchboard. Suitable earthling eyes/bolts (at min. two points) shall be provided on the main earthing bus to connect the same to the earth grid at the site. Sufficient number of star washers shall be provided at the joints to achieve earth continuity between the panels and the sheet metal parts.

8.0 INTERLOCKING

The panels shall be provided with the following interlocking arrangement.

a) The door of the switch-fuse compartments is so interlocked with the switch drive or handle that the door can be opened only if the switch is in `OFF' position. De-interlocking arrangement shall also be provided for occasional inspection.

b) It shall not be possible for the breaker to be withdrawn when in `ON' position.

c) It shall not be possible for the breakers to be switched on unless it is either in fully inserted positions or for testing purposes in fully isolated position.

d) The breaker shall be capable of being raked in to `testing' `isolated' and `maintenance' positions and kept locked in any of these position.

e) A safety latch to ensure that the movement of the breaker as it is withdrawn, is checked before it is completely out of the cubicle shall be provided.

9.0 WIRING

All wiring for relays and meters shall be with PVC insulated copper conductor wires. The wiring shall be coded and labeled with approved ferrules for identification. The minimum size of copper conductor control wires shall be 1.5 sq.mm except for the circuits related to current transformers or circuits with current carrying capacity more than 5 Amps (for which min. 2.5 Sq.mm copper conductor wires shall be used).

10.0 SHEET STEEL TREATMENT AND PAINTING

Sheet Steel materials used in the construction of these units should have undergone a rigorous rust proofing process comprising of alkaline degreasing, descaling in dilute sulfuric acid and a recognised phosphating process. The steel work shall then receive two coats of oxide primer before final painting. Castings shall be scrupulously cleaned and fettled before receiving a similar oxide primer coat.

All sheet steel shall after metal treatment shall be powder coated with shade RAL 7032 (Siemens Gray) on the outside of the panel and mounting plates shall be of orange shade . Each coat of paint shall be properly stoved and the paint thickness shall not be less than 50 microns (shade of paint may be changed if the Engineer In charge so desires).

11.0 NAME PLATES AND LABELS

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

12.0 INSTALLATION

Installation shall be done by erection Contractor.

13.0 TESTING AND COMMISSIONING

Copies of type tests and routine test as per relevant specification, carried out at manufacturer’s work shall be submitted to the ENGINEER IN CHARGE as required.

Wiring and connections including earthing shall be checked for continuity and tightness.

Insulation shall be measured with a 500 V megger and insulation resistance shall not be less than 100 Mega ohms

Interlocking operation to be checked as per requirement.

Tests shall be performed in presence of authorized representative of the ENGINEER IN CHARGE for which the contractor shall give due prior notice.

14.0 HIGH VOLTAGE TEST

A high voltage test with 2.5 KV for one minute shall be applied between the poles and earth. Test shall be carried out on each pole in turn with the remaining poles earthed, all units raked in position and the breakers closed. Original test certificate shall be submitted along with panel.

15.0 PRE-COMMISSION TESTS:

Panels shall be commissioned only after the successful completion of the following tests. The tests shall be carried in the presence of Architect's/Consultant's or their representatives.

i) All main and auxiliary bus bar connections shall be checked and tightened.

ii) All wiring termination and bus bar joints shall be checked and tightened.

iii) Wiring shall be checked to ensure that it is according to the drawing.

iv) All wiring shall be tested for insulation resistance by a 1000 volts meggar.

v) Phase rotation tests shall be conducted

vi) All relays and protective devices shall be tested for correctness of settings and operation by introducing a current generator and an ammeter in the circuit.

16.0 CLIMATIC CONDITIONS:

The panels & switch gear components shall be suitable for following climatic conditions:

Maximum Minimum

DBT 45OC 3OC

RH 90% 20%

17.0 HEATING ARRANGEMENT:

The panel shall be provided with a thermostatically controlled heating arrangement for monsoon (200 Watt) to take care of high humidity conditions. A 6/16A service socket outlet (single phase) shall be provided in one of the compartments in all the panels.

18.0 METERING, INSTRUMENTATION AND PROTECTION

1.0 The specifications hereinafter laid down shall cover all the meters, instrumentation and protective devises required for the electrical work. The ratings, type and quantity of meters, instruments and protective devices shall be as per the schedule of quantities and drawings.

Measuring Instruments

General

Direct reading electrical instruments shall be in conformity with IEC-51, BS: 89 or IS: 1248. The accuracy of direct reading shall be 1.0 for voltmeters and 1.5 for ammeters. Other type of instruments shall have accuracy of 1.5. The error due to variations in temperature shall be limited to a minimum. The meter shall be enclosed in a dust tight housing. The housing shall be of steel or phenolic mould. The design and manufacture of the meters shall ensure the prevention of fogging of instrument glass. Instrument meters shall be sealed in such a way that access to the measuring element and to the accessories within the case shall not be possible without removal of the seal. The meters shall be provided with white dials and black scale marking. The pointer shall be black in colour and shall have zero position adjustment device which could be operated from outside. The direction of deflection shall be from left to right. Suitable selector switches shall be provided for all ammeters and voltmeters intended to be used on three phase supply.

a) Ammeters

Ammeters shall be moving iron type. The moving part assembly shall be with jewel bearings. The jewel bearing shall be mounted on a spring to prevent damage to pivot due to vibrations and shocks. The ammeters shall be manufactured and calibrated as per the latest edition of IS 1248 or BS 89. Ammeters shall be instrument transformer operated, and shall be suitable for 5 A. Secondary of instrument transformer. The scales shall be calibrated to indicate primary current, unless otherwise specified. The ammeters shall be capable of carrying sustained overloads during fault conditions without damage or loss of accuracy.

b) Voltmeters

Voltmeter shall be of moving iron type. The range for 400 volts, 3 phase voltmeters shall be to 0 to 500 volts. Suitable selector switch shall be provided for each voltmeter to read voltage between any two lines of the system. The voltmeter shall be provided with protection fuse of suitable capacity.

2.0 INSTRUMENT TRANSFORMERS

Current Transformers

Current transformers shall be in conformity with IS:2705 (Part-I, II, & III) in all respects. All current transformers to be used in the L.T. Electrical panels shall be low tension, ring type resin cast current transformer with the requisite currents ratio having secondary of the current transformers selected will be based on the following;

1. For energy measuring : 1.0 class of accuracy.

2. For other metering : 1.5 class of accuracy.

3. For protects on : 3.0 class of accuracy. Where a common CT is used for different functions the CT accuracy class will be equal to the best class required by any of those function.

Current transformers shall be capable of withstanding without damage, magnetic and thermal stresses due to short circuit fault of 35 MVA on medium voltage system. Terminals of the current

transformers shall be marked permanently for easy identification of poles. Current transformers shall be provided with earthing terminals for earthing chassis frame work and fixed part of the metal casing (if any). Each CT shall be provided with rating plate indicating the following:

1. Name and make
2. Serial Number
3. Transformation ratio
4. Rated burden
5. Rated voltage
6. Accuracy class

The current transformers to be selected for this panel will have at least 20% extra VA capacity available over the normal capacity based on the following details ;

1. For ammeters : 3 VA
2. For current coils of KW & KWHR, PF, KVAR meters or for all recorders : 5 VA.
3. For normal wiring : 2 VA.
4. For current coil of protection relays: 10 VA under; no circumstances the VA rating of the CT's will be less than 15 VA.

Current transformers shall be mounted such that they are easily accessible for inspection, maintenance and replacement. The wiring for CTs shall be copper conductor, PVC insulated wires with proper termination lugs and wiring shall be bunched with cable straps and fixed to the panel structure in a neat manner.

3.0 CONTROL DEVICES

a) Push Buttons

The push buttons used in the panels will be rated for more than 415 volts and 2 amps. All the push buttons will be mounted on the front door and the assembly will be in two parts. All the push buttons

will be mounted on the front door of the cubicle in regular symmetrical fashion as per the general norms being practiced. Only one make of push buttons will be used in the assembly of all the panels.

The selection of the colour of the push buttons will be as follows

Function Colour

Starting/Switching ON Green

Stopping/Switching OFF Red

Resetting Black

Forward ON Yellow

Reverse ON Blue

Emergency OFF Red/Mushroom

b) Indicating Lights

The indicating lights used in the panel will be pleasant looking and round shape having the following features;

1. A separate front lens for it's easy replacement.

2. Facility to replace the bulb from the front.

3. Baynet pin cap bulbs of standard size to be used.

4. The shape of the lens to allow viewing from sides.

5. Series resistance with use of low voltage bulb for longer life.

6. Clear and distinct indication for light ON and OFF with differences of brightness of the lens.

The selection of the colours of the indicating lamps will be as follows:

- Red for system in operation

- Amber for system ready for operation.

- Green for system being put off.

- Red, yellow and blue for incoming supply.

5.0 TESTING

5.1 Instrument transformers shall be tested at factory as per IS:2705 & IS:3156. The test shall incorporate the following:

a) Type tests

b) Routine tests

Original test certificates in triplicate shall be provided.

5.2 Meters shall be tested as per IS: 1248. The tests shall include both type tests and routine tests. Original test certificate in triplicate shall be furnished.

5.3 a) Suitable injection tests shall be applied to the secondary circuit of every instrument to establish the correctness of calibration and working order.

b) All relays and protective devices shall be tested to establish correctness of setting and operation by introducing a current generator and an ammeter in the circuit.

19.0 MINIATURE CIRCUIT BREAKERS

The MCB's shall be of the completely moulded design suitable for operation at 240/415 Volts 50 Hz system. MCB’s shall be quick make and break type conforming to relevant IS. Housing shall be heat resistant and have a high impact strength. MCB’s shall be flush mounting type and shall be provided with trip free manual operating liver with ON/OFF indications

MCB’s shall be provided with magnetic thermal releases for overcurrent and short circuit protection. The overload or short circuit device shall have a common trip bar in case of DP and TPN MCB’s. The MCB's shall have inverse time delayed thermal overload and instantaneous magnetic short circuit protection. The MCB time current characteristic shall coordinate with H.R.C. fuse/PVC cable characteristic.

The MCB's shall have a minimum breaking capacity of 10 kA at 230/415 volts in accordance with IEC :

898 - 1995 and IS : 8828 – 1996

20.0 MOULDED CASE CIRCUIT BREAKERS

1.0 GENERAL

Moulded case circuit breakers shall be incorporated in the switch board wherever specified. MCCB shall conform to IEC:947-II or IS:13947-II in all respects. MCCB shall be suitable for three phase 415 volts AC. Suitable discrimination shall be provided between upstream and down stream breakers in the range of 10-20 milli seconds. All MCCBs will have earth fault module (if specifically asked) and front operated. All four pole MCCB shall be suitable for three phase four wire system, with the neutral clearly identified and capable of first make last break feature.

2.0 CONSTRUCTION

The MCCB cover and case shall be made of high strength heat-resistant and flame retardant thermosetting insulating material, operating handle shall be quick make/quick break. The operating handle shall have suitable `ON' `OFF' and `TRIPPED' mechanical indicators notable from outside. All MCCBs shall have a common operating handle for simultaneous operation and tripping of all the three phases. The MCCB should be suitable for disconnection and isolation with marking on front name plate.

Suitable arc extinguishing device shall be provided for each contact. Tripping unit shall be thermal magnetic type provided on each pole and connected by a common trip bar such that tripping of any one pole operates all three poles to open simultaneously. Thermal magnetic tripping device shall have IDMT characteristics for sustained over load and short circuits. All MCCBs above 250 Amps will also have short circuit magnetic pickup level adjustment.

MCCBs

All MCCBs shall have variable thermal overload releases which can be adjusted at site.

3.0 Contact tips shall be made of suitable arc resistant, sintered alloy for long electrical life. Terminals

shall be of liberal design with adequate clearances. All MCCBs of higher ratings above 250 Amps, shall be provided with separate extended arcing contacts.

4.0 INTERLOCKING

Moulded case circuit breakers shall be provided with the following interlocking devices for interlocking the door of a switch board.

a) Handle interlock to prevent unnecessary manipulations of the breaker.

b) Door interlock to prevent the door being opened when the breaker is in ON or OFF position.

c) Defeat-interlocking device to open the door even if the breaker is in ON position.

5.0 BREAKING CAPACITY

The moulded case circuit breaker shall have a rated service. Short circuit breaking capacity of not less than 25 KA rms at 415 volts AC. Wherever required, higher breaking capacity breakers to meet the system short circuit fault shall be used.

6.0 ACCESSORIES

All the accessories like shunt, undervoltage contact blocks shall be of snap fitting possible at site.

7.0 TESTING

a) Original test certificate of the MCCB shall be furnished.

b) Pre-commissioning tests on the switch board panel incorporating the MCCB shall be done as per standard specifications.

21.0 MEDIUM VOLTAGE AIR CIRCUIT BREAKER

1.0 GENERAL

Air circuit breakers shall be incorporated in the panels wherever specified. ACB shall conform to IEC 947-II or IS: 13947-II in all respects. ACBs shall be suitable for operation on 415 volts, 3 phase, 50 Hz, AC supply. All air circuit breakers using in the panel will be mounted in separate cubicles and will be of the same make to maintain the uniformity.

2.0 TYPE AND CONSTRUCTION

Air circuit breakers shall be of enclosed pattern, dead front air break type with trip free operating mechanism. All ACBs will be thermal magnetic type. Air Circuit breakers shall be of with drawable type and will be mounted on a rigid steel frame. The ACBs shall be strong and robust in construction with suitable arrangement for anchoring when in fully engaged or fully drawn out positions. There shall be no dependence upon the panel board frame for any critical alignment. The withdrawal arrangement shall be such as to allow smooth and easy movement. The ACB shall have minimum four positions service, test , isolated and maintenance.

All the current carrying parts of the circuit breakers shall be silver plated. Suitable arcing contacts shall be provided to protect the main contacts. The contacts shall be of spring loaded design. The sequence of operation of the contacts shall be such that arcing contacts `make before' and break after the main contacts. Arcing contacts shall be provided with efficient are chutes on each pole. The contact tips and arc chutes shall be suitable for ready replacement. Self aligning isolating contacts with automatic shutters to screen the live parts shall be provided. The design of the breaker shall be such that all the components are easily accessible for inspection, maintenance and replacement.

Operating Mechanism Air circuit breaker shall be provided with a quick-make, trip free operating mechanism. The operating mechanism shall be strain-free spring operated. The system will have horizontal, self-aligning, isolating pairs of moving and stationary power and control contracts. The unit will have three horizontal positions corresponding to:

a) Plugged in Position

Here both the power and control contacts are in made position and the breakers gets mechanically locked in this position. The breaker can go in ON position only after being locked in this position.

b) Test Position

Here the power contacts gets isolated where as the control contacts can be kept in made status.

The breakers can be mechanically locked in this position and made ON and off for testing purposes.

c) With drawn Position

In this position the power and control connections are in isolated status and the moving portion of the breaker can be dismantled from the panel.

An isolating shutter or set of shutters are to be provided for the automatic coverage of live power and control fixed isolating contacts in the withdrawn position.

All the breakers with remote closing arrangement will have a spring charging motor of single phase 230 V and a closing coil. In case of power failure the spring charging can be done manually with the help of button or lever. The circuit breaker should switch on only when the spring is charged fully which should be able to store energy for one closing and one tripping operation. The spring will also get fully charged when the breaker is in closed position. In this case the spring should store enough energy to make first tripping, one re-closing and the second tripping.

The ACB should have an anti pumping feature.

The breaker will have quick making trip free closing mechanism. The operation of the mechanism will be independent of the speed of the closing lever or the duration of the closing signal.

The breaker will have following indications distinctly not able from out side :-

- Mechanical indicator for spring fully charged.
- Mechanical indicator for spring discharged.
- Electrical indication of breaker ON status.
- Electrical indication of breaker OFF status.
- Electrical indication of trip circuit healthy.

- Separate trip indication for overload and short circuit.

All breakers will have switching ON and OFF time of less than 4 cycles and will have the following interlocks for the safe operation of the equipment.

Breakers to ON only when mechanically locked many of the three horizontal isolation position.

When the breaker is in plugged in position it will ON only with the front door closed.

The breakers will be provided with 6 Nos. each of type NO and NC auxiliary contacts rated for 10 Amps AC at 415 V and 6 Amps DC at 48 V. These contacts are in addition to the ones already in use for the operation of the breaker and will be required for subsequent interlocks incorporated in near future.

When ever requested mechanical positive inter locks will be provided between the operation of different breakers with the help of individually unique and matched castle key locks.

Rating The rating of the circuit breaker shall be as per the drawings and schedule of quantities. The rated breaking capacity of the breakers shall be minimum 50 KA or as specified at 415 volts AC.

The rated making capacity shall be as per relevant standard.

Accessories

Circuit breakers shall be provided with the following Accessories.

a) Under-voltage relay for the incoming ACB.

b) Overload release with IDMT characteristics.

c) Instantaneous over current relays.

d) Alarm switches (if specifically asked for)

e) Auxiliary switches

f) Circuit breaker position indicators ON/OFF/TEST/ ISOLATED.

Testing

Testing of each circuit breaker shall be carried out at the works as per IS:13947-II and the original

test certificate shall be furnished in triplicate. The tests shall incorporate at least the following:

a) Impulse withstand test

b) Power frequency withstand test

c) Short circuit test

d) Temperature-rise test under rated conditions.

9.1 ADDITIONAL REQUIREMENTS

1 The contractor shall submit the original manufacturer's test certificates in respect of, ACB, Pumping Sets, Motors, Starters, Main switches etc.

2 The aluminum copper conductor cable (heavy) should be ISI marked PVC insulated, armored and should be confirming to relevant IS-Specifications, codes with latest amendments.

3 Test Certificate:-

A test certificate from the manufacturers shall be handed over to the department before installation of the equipment specifying that the equipment conforms to relevant I.S. S/P.W.D. specifications.

4 Wiring Diagram:-

After completion of the work a complete drawing showing connections to the various equipment is to be prepared by the tenderer and to be submitted to the department along with final bill of the work.

5 Connections:-

Inter connections from the bus-bar chamber to the different main switches/Air circuit breakers should be through solid copper bars of the required capacity duly insulated for which no extra payment will be made.

6 The rates quoted should be F.O.R. at site of work including cost of installation, freight, octroi taxes and other charges. Nothing extra over and above rates will be admissible.

7 Superflous conditions and conditional tender will be rejected.

8 Telegraphic tenders and tenders without earnest money in shape of deposit at call will not be accepted.

9 The machinery will be installed as per standard P.W.D. specifications and to the entire satisfaction of the Engineer-in-charge.

10 The quantity of electrical equipment and pumping sets can be increased/ decreased by the department.

11 The tender submitted by the firms shall be valid for 90 days (3 months) from the date of opening of Price Bid.

12 In case any mistake is found in the N.I.T. the same shall be rectifiable even after the opening of the tender and execution of contract agreement as per requirement and site conditions.

13 Pump, Motor, Generator, Starters, ACB shall be inspected by Department officers at the factory premises before being transported to the store or agency/work place.

9.2 OPERATION & MAINTENANCE

9.2.1 The contractor shall maintain all Independent Feeders erected under this contract for a period of 12 months during the Defect Liability Period. Details of staff to be deputed during the maintenance period shall be submitted to the Engineer-in-Charge and prior approval shall be taken.

GENERAL

1. The Bill of Quantities shall be read in conjunction with Conditions of Contract and Specifications as these documents are jointly explanatory and descriptive of the works included in the contract.

2. Special Condition of contract Specifications and descriptions of work and materials given elsewhere in the contract documents are not necessarily repeated in the bill of quantities and form part of Bill of Quantities. Reference is to be made to the other documents for information.

3. The Contractor shall be deemed to have visited the site before preparing his Tender and to have examined for himself the conditions under which the work will be priced and all other factors affecting the execution of the work and the cost thereof.

4. The Quantities of work and material in the "Bill Of Quantities" are not to be Considered as limiting or extending the scope of work to be done and materials to be supplied by the Contractor. The quantities in the "Bill of Quantities" are an estimate of the amount of work but the work will be measured on complete and the contractor will be paid on the actual measurement of work approved by the Consultant.

5. Any special methods of measurements used are stated at the head of or in text of the Bills of Quantities for the items affected. All other items are measured net in accordance with instructions of the Consultant and no allowance has been made for wastage. Unless otherwise specified measurements shall be as per relevant Indian Standard.

6. A price or rate in figures is to be entered against the item in the Bill of Quantities, whether Quantities are stated or not. Item against which no price is entered will be considered as covered by other prices or rates in the Bills.

7. The Prices and rates inserted are to be full inclusive value of the works described under the various items, including all costs and expenses which may be required for the completion of the described, together with all cost and obligations set forth or implied in the Conditions of Contract and Specifications.

8. Some finishing items may have variations in quantities which shall not affect any rates quoted.

9. Where prices have been entered against Lump sum items, payment for such affected items shall be made in proportion to the extent of which at the time of billing, works have been done at the discretion of the Consultant.

10. Providing and fixing shall mean that the contractor has to provide such materials not being procured and borne by the Owner, but which are required for the items and if no material need be provided by the Contractor, the rate shall be only for fixing of the component covered in the item.

The acronyms used in the Bill of Quantities.

a)	Cu. Ft.	:	Cubic Feet
b)	Sq. Ft.	:	Square Feet
c)	R.Ft.	:	Running Feet
d)	Kg.	:	Kilogram
e)	LS	:	Lump sum
f)	Nos.	:	Numbers
g)	Q.R.O.	:	Quoted Rate Only
h)	C.E.	:	Consultant's Engineer

RECOMMENDED BRANDS:

Unless otherwise approved, the following brands shall be used for these works.

ITEM	BRANDS
CEMENT	ACC, BHARATHI , ULTRATECH(53 GRADE FORRCC CASTING& 43 GRADE OPC/PPC/GGBFS FOR REPAIRS & PLASTERING)
SAND	BAGGED POZZOLONA / SILPOZ SAND / GOOD QUALITY RIVER SAND
EPOXY RESIN + HARDENER	CHRYSO/HUNTSMAN / DR. BECK / CIBATUL
ACRYLIC POLYMER/ LATEX	CHRYSO/PIDILITE/STP/PAR/PROTÉGÉ
RUST REMOVER/CONVERTER	CHRYSO/FEOVERT (KRISHNA CONCHEM) /PAR/PROTÉGÉ
RUST PASSIVATOR	CHRYSO/RUSKIL/ RUSTICIDE/PAR/PROTÉGÉ
CONCRETE ADMIXTURE	CHRYSO/PIDICRETE CF 101/ CONPLAST P509
INTEGRAL WATERPROOFING COMPOUND	CHRYSO/PIDIPROOF LW/ POLYPLAST MP/STP / CONPLAST X 421 IC/SHERWIN-WILLIAMS
GYPSUM PLASTER	GERMAN GYPSUM, INDIA GYPSUM, ST. GOBAIN
POLYSULPHIDE SEALANT	CHRUYO / PIDILITE
PLUMBING PIPES UPVC WATERSUPPLY	PRINCE (JAYANTIBHAI CHHEDA GROUP) / KISAN
PREMIX PLASTER	ULTINOVA, ROOFIT, WALPLAST
CPVC WATER SUPPLY PIPES SCHEDULE 40/80/120	PRINCE (JAYANTIBHAI CHHEDA GROUP) / ASTRAL
COMPOSITE MULTILAYER WATER SUPPLYPIPES	KITEC, KISAN, VICTUS

PVC DRAIN PIPES TYPE A & B	PRINCE (JAYANTIBHAI CHHEDA GROUP) / KISAN / FINOLEX
C. I. PIPES	NECO, KAPILANSH,
UPVC UNDERGROUND PIPES	SUPREME/PRINCE (JAYANTIBHAI CHHEDA GROUP)
NOISE REDUCING DRAIN PIPES	PRINCE SILENTFIT (JAYANTIBHAI CHHEDA GROUP) / ASTRAL VOVRIN
M.H. COVERS/ CHAMBERS	SUPREME/PRINCE (JAYANTIBHAI CHHEDA GROUP), THERMODRAIN
PLUMBING SEALANTS	PIDILITE MAKE, ASIAN PAINTS
UPVC VALVES	PRINCE BALL VALVES (JAYANTIBHAI CHHEDA GROUP)
CRACK FILLERS	PIDILITE, STP, FOSROC
CRYSTALINE W/P COATING	PENETRON, STP, FOSROC
COLOURLESS SILANE SILIOXANECOATING	ZYCOSIL, STP, FOSROC
EPOXY/PU COATING (FLOOR/WALL)	S P CONCARE/JOTUN/CHRYSO/FOSROC/BASF
EXTERIOR TEXTURE/ STONE CHIP FINISH	JOTUN/TEXTURE CONCEPTS / ASIAN PAINTS
SEMI ACRYLIC PAINT	JOTUN/SHERWIN-WILLIAMS / AKZONOBEL/ASIAN
EXTERIOR 100%ACRYLIC PAINT	JOTUN/SHERWIN-WILLIAMS/ BERGER, AKZONOBEL/ASIAN
EXTERIOR PU COATING	JOTUN/SHERWIN-WILLIAMS/ BASF
ELASTOMERIC COATING	JOTUN/SHERWIN-WILLIAMS / NEW WORLD / STP/ PIDILITE
EMENT PAINT	NEROCEM/ SWCEM (SHERWIN-WILLIAMS)/ SNOWCEMPLUS
ENAMEL PAINTS	JOTUN/ASIAN/ SHERWIN-WILLIAMS /AKZONOBEL
ANTIRUST COATING ON METAL	BERGER, FOSROC, SIKA

INTERNAL ACRYLIC EMULSION	JOTUN/ASIAN/ SHERWIN-WILLIAMS /AKZONOBEL
PREMIX MORTAR REPAIR	PIDILITE / CHRYSO/FOSROC
MICRO CONCRETE	PIDILITE / BASF/STP/ PAR
GLASS/CARBEN FIBER WRAPPING	SIKA/S P CONCARE/BASF
FIBERS	FIBER MESH (ONLY POLYPROPYLENE)OR EQUIVALENT
STONE FINISH TEXTURE	TEXTURE CONCEPTS, ASIAN, BERGER,AKZONOBEL
APP MEMBRANE	TIKIDAN/PIDILITE/STP

ALL OTHER SPECIFICATIONS ARE AS PER TECHNICAL DATA SHEET OF MANUFACTURER OR AS RECOMMENDED BY CONSULTANT.

[A] CHECK LIST: Details of Enclosures.

Sl.No	Description of item	Enclosed Page. no
1.	Tender Document including Letter of Proforma A	
2.	Audited Balance Sheet and Profit & Loss statement for the past three financial years duly certified by a Chartered Accountant.	
3.	Solvency certificate by a Scheduled Bank	
4.	Certificates / Reports for: a) Firm / Company registration b) Completion certificates c) Performance Reports d) Solvency Certificate	
5.	Details of key technical and administrative personnel employed by the firm/ company.	
6.	Any other important information.	
7.	Have you enclosed the entire drawings placed in the website	

Date and Place:

SIGNATURE OF APPLICANT(S)

Note: Exceptions of the above, if any, shall be clearly mentioned with details by the tenderer for evaluation/consideration if any.

Even though an applicant may satisfy the above requirements, he would be liable to disqualification if he has:

(a) Made misleading or false representation or deliberately suppressed the information in the forms, statements and enclosures required in the tender document.

(b) Record of poor performance such as, abandoning work, not properly completing thecontract, or financial failures / weaknesses etc.

DEPUTY ZONAL MANAGER

INDIAN BANK

Zonal Office Mumbai South