STEEL & INDUSTRIAL FORGING LTD.

(A Government of Kerala Undertaking)

ATHANI P.O

THRISSUR – 680 581

Email: *stiflprojectsdept@gmail.com* *Phone:* (0487) 220 1751

TENDER NOTICE

TENDER REF NO: SIFL/PROJ/COB/TN/2024-25 Date: 13.08.2024

Item rate tenders are invited for the following work through online bid (Two cover system) through Kerala Govt. E-tender portal *http//etenders.kerala.gov.in*

SI NO	NAME OF WORK	PAC (In Rs)	TIME OF COMPLETION
1.	Tender for construction of Corporate Office Building (Area: 7736 Sq.ft) at M/s Steel and Industrial Forgings Ltd, Athani, Thrissur, Kerala		10months

Tenderers should have previous experience in execution of similar projects. Work completion certificate should also be uploaded with the tender.

Bid submission start date : 13.08.2024
Bid submission end date : 25.09.2024
Technical Discussion date : 06.09.2024
Bid opening date : 28.09.2024
Tender Fee : 8,850/-
EMD : 1,00,000/-

STEEL & INDUSTRIAL FORGING LTD.

Sd/-
MANAGING DIRECTOR

STEEL & INDUSTRIAL FORGING LTD.

(A GOVT. OF KERALA UNDERTAKING)

ATHANI P.O, THRISSUR, KERALA – 680581

TENDER DOCUMENT FOR THE CONSTRUCTION OF CORPORATE OFFICE BUILDING AT SIFL, ATHANI P.O, THRISSUR, KERALA

Contents

1. NOTICE INVITING TENDER

Steel & Industrial Forgings Ltd invites online bids (E-TENDER), through the Kerala Govt. tender portal http://etenders.kerala.gov.in, from contractors for Construction building:

a) Construction of corporate office building at SIFL, Athani, Thrissur having area – 7736sqft

1. The Bid should be submitted online at website http://etenders.kerala.gov.in the relevant covers only, by the due date and time, as specified in the "Critical Dates" view of the "Work Item details" of the tender. Late/delayed tenders submitted online after the due date and time, for whatsoever reasons will not be considered. The Server Date & Time as appearing on the website. http://etenders.kerala.gov.inshall only be considered for the critical date and time of tenders. Offers sent through post, telegram, fax, telex, e-mail, courier will not be considered.

2. Partially completed/incomplete bids shall not be considered.

3. Tender received after the specified time and date will be rejected.

4. When a tenderer submit his tender in response to this document, he will be deemed to have understood fully about the requirements and terms & conditions.

5. All communication regarding the tender including queries if any and submission of offers shall be done online within the e-Procurement system at website http://etenders.kerala.gov.in

6. Bidders shall be required to arrange all resources, including Digital Signature Certificates and Internet Connections at their own cost, for participating in online tenders at http://etenders.kerala.gov.in

7. Steel & Industrial Forgings Ltd shall not be responsible for any delays reasons what so ever in receiving as well as submitting offers, including connectivity issues. Steel & Industrial Forgings Ltd shall not be responsible for any postal or other delays in submitting EMD/tender cost wherever applicable.

8. Steel & Industrial Forgings Ltd will not be responsible for the cost incurred in preparation and submission of bids including the cost of digital certificate, regardless of the conduct of outcome of the bidding process.

9. Before submission of tender, the tenderers are requested to visit the site and make themselves fully conversant with the scope of work and study all technical specifications, conditions of contract etc. so that no ambiguity arises on a later date in those respects.

10**. <u>Validity</u>**

Tenders will be considered firm for acceptance for a period of 90 days from the date of opening of tenders. If it is found necessary to keep the tender open for a further period, prior consent of the tenderer shall be taken for every further period of extension of validity.

11. Details of payment of Tender fee and EMD shall be send to us separately before opening the tender.

Address to: Managing Director

Steel and Industrial Forgings Ltd.,

Athani P.O, Thrissur,

Kerala - 680581

PH: 0487 2201751

12. Two cover system

Bidders are required to submit offer in Two covers, namely "Fee/Prequal/Technical "and

"Financial".

Cover I ("Fee/Prequal/Technical")

Bidders are requested to upload the scanned copies of the following details "online".

a) The scanned copy of our Tender notice duly sealed and signed in all pages.

b) The scanned copy of our Tender Documents duly sealed and signed in all pages.

c) Scanned copy of Technical specification and drawings duly sealed and signed in all pages.

d) Scanned copy of documents to prove eligibility criteria.

Cover II (Financial / Price Bid)

Bidders are requested to quote rates in the Finance cover (BOQ) only. Please do not quote/mention rates anywhere else in the tender other than BOQ.

13. Hard copy of all tender documents except price bid is to be submitted to the office of Steel and Industrial Forgings Ltd, Athani, Thrissur, Kerala-680581 within 4 days from submission of tender online.

14. Please note that queries related to enquiry specifications, terms & conditions etc. should be submitted online only by logging in at http://etenders.kerala.gov.in before the clarification end date/time specified in the 'Critical Dates' view of "Work item Details". Steel & Industrial Forgings Ltd, at its sole discretion, may not entertain the queries sent by post/fax/e-mail or through any other mode of communication.

15. Tender opening will be done online at the time and dates specified in the tender "Critical

Dates View" of "Work Item Details".

16. The bidders are requested to go through the instruction to the bidders in the website http://'etenders.kerala.gov.in . The bidders who submit their bids for this tender after digitally signing using their Digital Signature Certificate (DSC), accept that they have clearly understood and agreed the terms and conditions in the website including the terms and conditions of this tender.

17. Steel & Industrial Forgings Ltd reserves the right to accept any offer in whole or in part or reject any or all offers without assigning any reason. Steel & Industrial Forgings Ltd. reserves the right to accept any or more offers in the part. Decision of Steel &Industrial Forgings Ltd in this regard shall be final and binding on the bidder.

18. Initially technical bid will be opened. After completing the technical evaluation, the price bids of technically qualified vendors will be opened.

You are requested to sign and upload the copy of all tender documents such as Tender notice, terms and conditions, instructions to tenderers, prequalification application, qualifying information forms, specifications, drawings etc. as a token of your acceptance along with bid submission.

2. ELIGIBILITY CRITERIA

1. Average annual financial turnover during the last 3 years, should be atleast 90% of the estimated cost and 3 years audited balance sheet should be submitted.
2. Experience of having successfully completed similar works during the last 5 years for Government departments, Government undertakings, reputed private sectors etc. should be as below:

    a. Similar completed works costing not less than 90% of the estimated amount.

3. Should possess a valid A category registration of the state PWD/KWA for a minimum period of 3 years

Tender bids not meeting any of the above pre-qualification criteria shall be rejected.

3. TERMS AND CONDITIONS

1. The Tender and any order resulting from this Tender shall be governed by our conditions of contract and the contractor quoting against this Tender shall be deemed to have read understood the same.

2. Where Counter Terms and Conditions of business have been offered by the tenderer, we shall not be deemed to be governed by those unless our specific written acceptance thereof has been given.

3. No Conditions and Terms, notice of which has not been given by the tenderer while submitting tenders, will be considered by us, if put forward in subsequent correspondence.

4. The unpriced bid completes in all respects showing all technical details and supply conditions should be submitted by all tenderers without fail.

5. The terms and conditions for which notice has not been given by the tenderer while submitting tenders, will be considered by us, if put forward in subsequent correspondences.

6. Tender

a. Every tender shall be made in English.

b. If the Tenderer is a firm or company, the tender documents to be submitted by the authorized signatory of the firm.

c. If the tenderer is a partnership firm, copy of the partnership deed/agreement duly attested by the notary public to be enclosed.

d. Tenders not submitted in the appropriate forms, or if they are not complete in all respects, are likely to be rejected.

e. When a tenderer submits his tender in response to this document, he will be deemed to have understood fully about the requirements of the terms and conditions of the tenderer.

f. On the due date of opening, the tender will be opened.

g. Tenderers who failed to comply with earlier contractual obligations of company which resulted in short closure/cancellation of any contract are not eligible to participate in this tender.

h. Companies/Firms/Sole Proprietorships blacklisted/ordered for blacklisting by Govt. of Kerala or SIFL cannot be considered.

i. SIFL does not bind itself to accept the lowest tender or assign any reason for non-acceptance of the same.

j. Landed cost/net off GST shall be considered for price comparison and order placement.

7. Tax: The quoted prices shall be deemed to be inclusive of all taxes and duties except "Goods and Services Tax" (here in after called GST) (i.e. IGST or CGST and SGST/UTGST applicable in case of interstate supply or intrastate supplies respectively).

8. Tender Fees and EMD (Earnest Money Deposit):

Bidders should remit Tender Fees and EMD at the time of online bid submission using the online payment options of e-procurement system. Bidders are advised to visit the "Downloads" section of e-procurement (www.etenders.kerala.gov.in) for detailed instructions on making online payment using internet banking facility of SBI or by using NEFT facility. Any existing amount available with SIFL in any form will not be adjusted against the payments of this tender.

a. Tenderers are required to remit an amount of Rs.8,850/-(Rupees Eight Thousand Eight hundred and fifty Only) Inclusive of GST as Tender Fees and Rs.1,00,000/-(Rupees One Lakhs Only) towards Earnest Money Deposit.

b. Bidders, while participating in online tenders published in Government of Kerala's e-Procurement website (www.etenders.kerala.gov.in) should ensure the following:

c. Single transaction for remitting Tender document fee and EMD: Bidder should ensure that tender document fees and EMD are remitted as one single transaction and not separated. Separate or split remittance for tender document fee and EMD shall be treated as invalid transactions.

d. Account number as per Remittance Form only: Bidders should ensure that account No. entered during NEFT remittance at any bank counter or during adding beneficiary account in Internet banking site is the same as it appears in the remittance form generated for that particular bid by thee-procurement system.

e. Bidders should ensure that tender document fees and EMD are remitted only to the account number given in the Remittance form provided by e-procurement system for that particular tender. Bidder should ensure the correctness of details of inputs while remittance through NEFT. Please also ensure that your banker inputs the 22-digit Beneficiary account number (which is case sensitive) as displayed or appears in the Remittance form. Bidder should not truncate or add any other detail to the above account number. No additional information like bidder

name, Company name etc. should be entered in the account number column along with account number for NEFT remittance. While submitting tender the bidder shall seek clarification from IT missions e-procurement for online payment of the tender fee/EMD. Tender fee and EMD are to paid as a single remittance. SIFL shall under no circumstance be responsible for failed transactions on account of non-compliance of the above.

f. Only SBI's internet banking and NEFT remittance allowed: RTGS payments, Account to Account transfer or Cash payments are not allowed and are invalid mode of payments.

g. UTR number: Bidders should ensure that the remittance confirmation (UTR number) received after NEFT transfer should be update as it is, without any truncation or addition, in the e-Procurement system for tracking the payment.

h. One Remittance form per bidder and per bid: The remittance form provided by e-procurement system shall be valid for that particular bidder and bid and should not be re-used for any other tender or bid or by any other bidder.

i. The bids will not be considered for further processing if bidder fails to comply on points as above and tender fees and EMD will be reversed to the account from which hit was received.

j. Earnest Money Deposit will be fortified if the rates are enhanced from their quoted rate during validity period or extended period, or the order is not executed after the acceptance of the order.

k. Tenders received without EMD and Tender Fees will not be considered other than exemption from Govt like MSME Units.

9. All works shall be done in conformity with the KPWD/CPWD specifications and conditions of contract. The quoted rates should be inclusive of cost of all materials, labour charges, testing charges and all applicable taxes and duties.

10. The contractor shall provide his own tools, plant and store shed to store all materials and he will be entirely responsible for the proper storage, use and safe custody of all materials and also for any damage, loss, theft, mishandling and weathering due to any cause what so ever.

11. Performance Guarantee

The successful tenderer has to deposit an amount of 5% of order value as Performance Guarantee and execute an agreement with Steel & Industrial Forgings Ltd. In non-judicial stamp paper of value as per rules in the standard format within 7 days from the date of acceptance of work order.

12. Time of Completion:

The work should be completed in all aspects by the stipulated time of 10 months from the date of award of contract.

13. Measurement and Billing

1. Wherever mode of measurement is specified, the measurement will be taken at site as per the latest BIS code of practice for measurement.
2. The Contractor or his representative shall accompany the Consultants/Client or their representative in taking measurements and shall agree to the measurements taken on spot. Tapes shall be of steel and shall be supplied by the Contractor. The Contractor shall submit his bill based on the agreed and recorded measurements. On receipt of such bills the consultant will verify the measurements. If the Contractor fails to accompany the Consultants / Client for measurements, then he shall be bound by the measurements taken by the Consultants/ Client.
3. 10% of each part bill will be retained as retention amount for a period of five year from date of completion of work.

14. Payment Terms

As per following stages:

Stage 1: Completion up to concreting of footing

Stage 2: Column pedestal and plinth beam RCC works

Stage 3: First floor RCC

Stage 4: Second floor RCC

Stage 5: Lintel and brick works, sunshade of first and second floor completion

Stage 6: Electrical conduit and plastering

Stage 7: Painting and flooring

Stage 8: Interior works

Stage 9: Final Completion

Bills are prepared following stages. All bills shall be submitted with 15 days of completion of each event mentioned above.

10% of each part bill will be retained as retention amount for a period of five year from date of completion of work. 10% after fulfillment of all warrantee/guarantee period, including performance guarantee to purchasers satisfaction or producing the bank guarantee for equal amount valid for the guarantee period.

The final agreement will be based on plinth area rate, for the all items shown in drawings or BOQ (Except Chairs & Sofa's). If any item/Quantity is missing in BOQ/Drawing the Contractor should consider the Missing item/Quantity/Quantity Variation Due to the site condition while submitting the quotation. No upward revision of the rates quoted by the contractor will be allowed. The contractor should submit an item rate for each item mentioned on BOQ and it should be matched to the plinth area rate. The stage vice payment will be made based on the rates and quantity mentioned in the BOQ. The total payment against the project will be limited to total order value. SIFL will not pay any amount beyond that limit. Site condition or land level to be checked before submitting the offer, any additional work or quantity in later stage will not be considered. If there is any missing BOQ, should be informed in technical bid.

TENTATIVE WORK TIME SHEDULE		
Stage 1	Completion up to concreting of footing	1 Month
Stage 2	Column pedestal and plinth beam RCC works	0.5 Month
Stage 3	First floor RCC	1 Month
Stage 4	Second floor RCC	1.5 Months
Stage 5	brick works, Lintel and, sunshade of first and second floor completion	1 Month
Stage 6	Electrical conduit and plastering	1 Month
Stage 7	Painting and flooring	1 Month
Stage 8	Interior works -Partition walls etc.	1 Month
Stage 9	Final Completion	2 Months
	Total	10 Months

During the time of agreement signing the contract should submit a Gantt chart showing work schedule and time of completion. This will be considered as the final schedule and works will monitored based on this this schedule.

15. Delays in Commencement

The Contractor shall not be entitled to any compensation and/or damages for any loss suffered by him on account of delays in commencing, whatever the cause for such delays may be. Similarly, the Contractor shall not be entitled to claim any amount from Client for delays incompletion of work (operating maximum limit).

16. LD Clause

The date of completion agreed upon shall be strictly observed by the contractor and he shall show proportionate progress during the execution of work. In case of the completion is delayed beyond the stipulated period of completion, LD for the delay in completion of work shall be 0.5% of the unexecuted portion of the order value per week of delay subject to a maximum of 10% shall be applicable. Finally, SIFL reserves the right to get the work done otherwise at the risk and cost of the contractor if this work is delayed for a substantial period. Any liability imposed on CONSULTANT by the Owner on account of delay in completion of works shall be passed on to the Contractor.

17. Negotiation

The lowest tenderer will be required to attend the negotiation, if company so desires, at our office at Athani, Thrissur on a date fixed by the company. The date of negotiation as fixed by SIFL will be final and binding on the tenderer.

18. We reserve ourselves the right to accept or reject any tender without assigning any reasons.

19. Jurisdiction: Any dispute arising out of, or in connection with this rate contract shall be subject to the jurisdiction of the competent courts in Thrissur.

20. Before using any materials for the work the contractor shall arrange for testing of all materials in Government laboratories. Contractor shall make arrangements for witnessing of test by the consultant/SIFL Representative. Valid Test certificates to be provided for every supply of material.

21. <u>Water And Power</u>

The Contractor shall make his own arrangement for water and electricity required for the work. Water may be drawn from the source at site, if good quality water is available. The contractor shall submit test result of the water and the Client/Consultants takes no responsibility for the supply of either electricity or water. The contractor shall pay the electricity bills during the time of construction.

Temporary wiring/cabling shall not be routed across floors, around doors. It shall be

properly routed as directed by the Engineer-in-Charge. Temporary wiring shall be protected from sharp edges, heat and sunlight to avoid breakdown of the insulation.

22. The contractor shall be responsible for the safety of the laborers employed by him and he shall be liable to pay the necessary compensation in case of accidents as per Workmen's Compensation Act. Provisions of Indian Contract Labor Act also will have to be complied with in this respect. In case the contractor fails to comply with the regulations, the expenses incurred by Steel & Industrial Forgings Ltd. shall be recoverable from the contractor. Insurance under Workmen's Compensation as per regulations in force to cover contractor's workmen and staff shall be arranged by the contractor at his cost. Contractor is advised to cover all workers engaged by him for execution of this work, against accident/risk that may occur/involve during execution of this work. Steel & Industrial Forgings Ltd. will not undertake any liability, due to accidents, which may occur during the execution of this work, and the Contractor has to bear the same. PF, ESI etc. as per rules are to be made by the Contractor. The Contractor shall fully indemnify Steel & Industrial Forgings Ltd. of claims from workers or third party due to accident or damage to property including third party by taking adequate insurance coverage.

23. If electrification works are included in the scope of work, it will be the responsibility of the contractor to get the works executed through appropriate class of licensed contractor. Also he has to take necessary clearance or approval from the Electrical Inspectorate.

24. The contractor shall not without previous written approval of SIFL execute any Power of Attorney in respect of any matter relating to this contract and SIFL shall not be bound by any such Power of Attorney executed by the contractor without its prior approval. It shall be entirely within the discretion of SIFL to grand any such approval already given.

25. On completion of project the contractor shall clear all debris from site to the satisfaction of SIFL/Owner.

26. Sub-letting of work of any nature is strictly forbidden.

27. No work shall be done before or after working hours as well as on Sundays or Public holidays, without prior permission of Engineer-in charge of SIFL.

28. All local enactments applicable shall be complied with by the contractor.

29. The construction shall be carried out adhering to the standard CPWD/PWD norms as applicable.

30. The conditions in respect of quality of work, approved brand of material to be used etc. as

stipulated by the Owner should be complied.

31. All materials arranged for bonafide use or works including auxiliary works should not be misused in any manner. If any misuse or work through negligence by the contractor comes to light, the contractor is liable to pay penalty as may be fixed by the Engineer-in Charge.

32. The contractor shall be responsible for the proper use and bear the cost for protection of materials supplied for use on the work and bear any loss from deterioration or from fault workmanship or avoidable excessive use of materials etc. or from any other causes.

33. All materials or articles shall be approved by SIFL/Owner and use without such approval shall meet the risk of subsequent rejection. Such approval shall no tab solve the contractor from his responsibility to use materials and articles as per specification.

34. Materials, tools and plant if any entrusted with the contractor by SIFL in pursuance of the contract will be treated as an entrustment by SIFL and to be continued to be SIFL's property until actually and duly accounted for.

35. ESI, PF

All employees employed by the contractor should be covered by ESI and PF and the contractor will be liable to pay both employers and employees contribution as per the Act. Contractor shall indemnify SIFL against any claim in this regard.

36. The Employer's Registration number for both ESI and PF shall be mentioned in the profile, failing which, the bid summarily rejected.

37. Damage, if any, caused by the contractor to SIFL/Owner/third party's equipments during the course of work have to be rectified/replaced by the contractor at his own risk and cost.

38. The machinery, equipments and other valuables of the contractor at worksite shall be insured by him. SIFL will not give any financial assistance to him on account of any loss or damage to the valuable.

39. Deviation/ New item:

Any deviation in specification/any new item of work shall be executed only with the written consent of SIFL's site-in- charge.

40. Defect Liability Period:

Any defect developed within 'Defect Liability Period' of 5 years from the virtual completion of the work will have to be rectified by the contractor at their own cost and in case the defects are not rectified by the contractor, SIFL or their representative shall get the work done at the risk and cost of the contractor. The Client shall recover all expenses incurred in this regard from any amount due to the Contractor.

41. The rates are expected to cover all incidental charges and are for finished work as per specifications and conditions of contract. Billing will be done for the actual quantity of work done at agreed rates.

42. The rates quoted by the contractor shall be firm throughout the contract period and there shall be no upward revision of the rates quoted by the contractor for any reasons what so ever.

43. Contractor shall indemnify SIFL and the Owner against any accident to the works or his workers. All construction equipment's brought to the site will be insured by the contractor. Contractor will also insure your workmen under Workmen Compensation Act insurance policy. No extra amount shall be payable to the contractor on this account.

44. Contractor shall take out Contractor's All Risk (CAR) insurance policy jointly in the name of SIFL/Owner & the contractor.

45. These instructions with conditions stated there in shall form part of the contract documents.

46. In case of discrepancy between technical specification and item specification provided along with Bill of Quantities, the client decision will be final.

47. Tenders, which are not in conformity with the above tender conditions, are liable to summary rejection.

48. Any discrepancy in BOQ or specifications should be brought in to the notice of SIFL during technical bid submission itself. Any further claims will not be accepted.

4. SCOPE OF WORK

The scope of the Contractor's work as further stated in this document generally covers the following:

The work consists of Construction of Corporate office building at SIFL, Athani, Thrissur, In accordance with the "drawings" and "Schedule of Quantities". The civil, sanitary, plumbing, electrical, and pathways etc., are within the scope of this tender. It includes furnishing all materials, labour, tools and equipment and management necessary for and incidental to the construction and completion of the work. All work, during its progress and upon completion, shall confirm to the lines, elevations and grades as shown on the drawings. Should any detail essential for efficient completion of the work be omitted from the drawings and specifications, it shall be the responsibility of the contractor to inform the Client and to furnish and install such detail with client's concurrence. No works, for which rates are not specifically mentioned in the priced schedule of quantities, shall be taken up without written permission of the Client.

Before submitting the offer, requested to asses the site conditions/ requirements etc. after finalizing the offer no change will be entertained.

The contractor shall set up necessary field testing equipment's for day to day testing of materials like slump test for concrete, moulds for preparing concrete cube test samples, silt content and bulkage of sand etc. Regarding all factory-made products for which ISI marked products are available, only products bearing ISI marking shall be used in the work.

The Contractor shall ensure that all the changes in the drawings during the detailed engineering, construction and at any other phase shall be incorporated at any stage of the project. The Contractor shall note that safety is of paramount importance to the Company and that all work must be carried out in a safe and efficient manner.

The Contractor at all times should be fully familiar with all the HAZARDS associated with the work to be carried out and must take all necessary measures to avoid any accident during execution of the work.

A well experienced civil supervisor or engineer shall be present in the work site during the construction of building. The Contractor shall clean-up all the working are as used during the course of the work, and shall restore the lands traversed. Cut and scrap is considered a part of site clearance activity and shall be carried out immediately after works are completed.

5. TECHNICAL SPECIFICATIONS CIVIL WORK

5.1 General

The Technical Specifications in respect of all materials to be used, method of execution, workmanship and quality for each item of the work shall confirm to the latest Indian Standard.

In case where the specifications in the drawings or those given in schedule of quantities are found wanting, the latest IS specifications shall hold good.

Whenever reference has been made to Indian Standard or any other specifications, same shall mean to refer to latest specifications irrespective of any particular edition in the specifications below or in schedule of quantities.

5.2 Workmanship

The workmanship shall be the best of its kind and shall conform to Specifications as per relevant Indian Standard Specifications in every aspect or the latest trade practice and shall subject to the approval of the Engineer-in-Charge. All materials and / or workmanship which in the opinion of the Engineer-in-Charge is defective or unsuitable shall be removed immediately from the site and shall be substituted with proper materials and/or workmanship forth with.

5.3 Materials

All materials shall be best of their kind and shall conform to the latest Indian Standards.

All materials shall be of approved quality as per samples and approved by the Engineer-in-Charge.

5.3.1 Cement

Cement shall comply with the latest specifications confirming to IS:8112 for 43 grade OPC and IS 12269 for 53 grade cements as per preferred makes listed in Schedule of Quantities.

5.3.2 Reinforcement

High Yield Strength deformed bars conforming to IS1786–1990 Fe500 (thermo mechanically treated bars) and Mild Steel confirming to IS432 (part-1).

5.3.3 Coarse Aggregate

Coarse aggregate shall be of the best quality, hard machine crushed stone free from earth or any organic matter etc. Suitably graded and shall conform to IS:383-1990

5.3.4 Sand or M sand

Shall be rivers and clean, sharp, strong, angular and composed of hard siliceous materials. It shall be free from any harmful materials such as iron pyrites, coal mica, shale, clay alkali, soft fragments, sea shale, organic impurities, etc. It shall be obtained from approved quarries and shall conform to IS:383-1990.

5.3.5 Concrete Block masonry

The solid concrete blocks are used as load bearing units and shall have a block density not less than 1800 kg/m^3. These shall be manufactured for minimum average compressive strength of 4 and 5 N/mm^2 respectively.

5.3.6 Granite

Polished granite slab and tiles shall be of the kind specified in the schedule of quantities conforming to samples for colour & texture. The slab shall be machine cut to required dimensions and shall conform to IS Standards.

5.3.7 Plastic (Acrylic) Emulsion Paint and Enamel Paint

Plastic emulsion painting will be of approved brand of paint and colour conforming to IS: 5411 – 1991 & will be applied over a coat of primer & putty (including preparation of wall surface). Painting for the doors, windows, grills will be carried out with synthetic enamel paint of approved brand and colour over one coat of primer, metal putty all of relevant IS specifications 4511-1993.

5.3.8 Hardware Fittings for Doors

All the doors shall be provided with SS hinges, aldrops, tower bolts, locks etc. or as specified in schedule of quantities. The external doors shall be provided with approved makes. All the fittings shall be approved by the client.

5.3.9 Water

Water used for mixing concrete and mortar and for curing shall be clean and free from injurious amounts of oil, acid, alkali, salts, sugar, organic materials or other substances that may be deleterious to concrete or steel. The pH value of water shall be not less than “6”. Water has to meet the requirements mentioned in clause 5.4 of IS: 456–2000. Water for construction purpose

shall be stored in well protected and proper tanks.

5.3.10 Admixtures

Admixtures if used shall comply with IS 9103. Admixtures to concrete shall not be used without the approval of Engineer-in-Charge. When permitted, the contractor shall furnish full details from the manufacturer and shall carry such test before any admixture is used in the work to check particularly for Chlorides. Admixture may be used to modify one or more of the following properties of Fresh Concrete. To increase workability without increasing water content or to decrease the water content at the same workability.

a) To retard or accelerate both initial and final setting times.
b) To reduce or prevent settlement.
c) To increases light expansion in concrete and mortar.
d) To modify the rate or capacity for bleeding or both.
e) To reduce segregation of concrete, mortars and grouts.
f) To improve penetration & or pump ability of concrete, mortars & grouts.
g) To reduce rate of slump loss

If there are any discrepancies in specification of items of work in schedule of quantities and in specification schedule and also items not covered in technical specifications, latest. IS specification shall apply. Whenever items of materials not covered in IS specification, the approval of Engineer-in-Charge will apply.

5.4 Earthwork:

5.4.1 Site Clearance

The site shall be free from rubbish of all kinds, rocks, trees, dirt and superfluous earth, all shrubs, brush wood, stumps of trees and saplings, grass and other rant vegetation etc. The service able material to be stacked at site in a manner as directed by the Engineer-in-Engineer. All cavities or holes formed shall be filled with good earth well rammed and leveled neatly. Site clearance shall bed one all-round the proposed construction. The contractor shall provide all labour and material for site clearance at his own cost.

5.4.2 Profiles

Shall be with pegs, bamboos, strings or burgies to show the correct formation before the start of work and maintained till the completion of the work.

5.4.3 Bench mark and levels

The contractor shall layout one or more permanent bench marks in some central place before start of the work, from which all important levels exact bed levels for the excavation will be set

The contractor shall provide all labour and material for setting, levels and profile sat his own cost

All useful materials such as gravel, stone relics of antiquity, coins, fossils etc. met with during excavation shall remain the property of the employer and shall be handed over to the employer

All cutting shall bed one from top to bottom. No undermining shall be permitted.

Cutting shall be done to precise levels and any cutting taken deeper shall be made good with PCC1:4:8 to the required levels without any extra cost. The final surface shall be neatly dressed.

5.4.4 Excavation in trenches

The foundation trenches shall be excavated to the exact width of the lowest step of foundation or footing as shown on drawings. The sides of the trenches shall be kept vertical and bottom horizontal both transversely and longitudinally as shown on the drawings. Steps shall squarely bench out as shown on the drawings or as directed by the Engineer-in-Charge. The excavated earth shall be deposited at least with a lead of 50 meter away from the edge of excavation whichever is more. Working space on the outer periphery, if required, shall be provided by the contractor at his own Cost.

The bed of the trenches shall be made level and compact by watering and ramming, any soft and defective spots detected shall be filled with concrete of the mix as specified for foundations or as directed by the engineer. In case excavation is taken deeper than required, the extra depth shall be good with concrete as specified foundation or as directed by the engineer at no cost to the SIFL.

The contractor shall at his own expense shall make provision for all sorting, strutting, close or open timbering, pumping, dredging or bailing out water and the trenches shall be kept free from water until the work in foundation is completed and trenches refilled. The trenches shall be inspected and passed before concrete is placed.

The measurements shall be exact length and width of the lowest step of the trench of footings as shown on the drawings. The extra earthwork done by the contractor, providing steps etc. and earth making ramps/steps as approach to work place shall not be paid for.

5.4.5 Earth filling

Filling can be in the sides of foundation trenches, under floors or for site formation. The earth to be used for filling shall be free from salt, organic or other foreign matter. The space around the foundation in trenches and under floor shall be cleared of all debris, brick pieces or any other rubbish, surplus mortar falls etc. Filling shall be done in layers not exceeding 200 mm thickness. Each layer shall be well watered and rammed to the satisfaction of the Client. Final surface shall be neatly dressed. Black cotton soil shall not be used for filling in foundations and under floors.

5.5 Concrete

5.5.1 Plain Cement Concrete

For foundation concrete shall be mixed in proportion and with ingredients as specified in the schedule of quantities. The concrete shall be mixed in a mechanical mixer. No more concrete shall be mixed than can be consumed within half an hour. After laying and consolidation is completed water for a week from the next day shall be done. The measurements shall be to exact length, breadth and depth as shown on the drawing and after the concrete is consolidated.

5.5.2 Reinforced cement concrete work

5.5.2.1 General

It is the intent of these specifications to ensure that all concrete placed at various location in the job, should be durable, strong enough to carry the design loads, it should wear well and be practically impervious to water, it should be free from such defects as shrinkage ,cracking, honeycombing and spalling of the surface. Unless otherwise called for in this specification, all plain and reinforced concrete shall conform in all respect to IS:456–2000.

5.5.2.2 Mix design

Mix design shall be as per guidelines in IS: 10262 – 1982 reaffirmed in 2009 subject to minimum cement content as per IS 456-2000. The contractor at his cost should get the concrete mix designed from reputed laboratories in consultation with Engineer-in-Charge for further implementation in the site. Necessary weigh batchers, equipment’s should be used in the site to achieve required properties as per design mix and to enable the concrete to attain enquired compressive strength. The concrete should be tested for strength at 7 days & 28 days period. Any failure to achieve the strength needs removing such concrete and re concreting. The mix design shall be subject to approval of the Engineer-in-Charge. The contractor should submit a Mix design Report from. Approved Govt. Agency before starting concrete works for RCC structural Members.

5.5.2.3 Mixing:

All concrete whether plain or reinforced, ordinary or controlled shall be mixed in mechanical batch type concrete mixers conforming to IS 1791. The cement and aggregates shall be first mixed dry until all particles of aggregate are coated with cement. Water shall be added and mixing continued for at least two minutes to result in a concrete of a uniform colour and consistency. The proportion of aggregate sand etc. for various types of concrete shall be weighed in weigh batcher. The quantity of water used shall be minimum with practical workability and shall be varied as required to suit the moisture content of the aggregate and to produce having specified slump. Moisture correction for fine and coarse aggregates shall be made regularly.

5.5.2.4 Compaction of Concrete:

External, Internal (needle) and surface (screed board) vibrators of approved make shall be used for compaction of concrete) External/internal vibrators shall be used for compaction of concrete in foundations, column, beam, slabs etc. For sections such as slabs, the concrete shall be compacted by external, internal and surface type vibrators, depending on the thickness of layer to be compacted. 25mm, 40mm and 60mm dia internal vibrators may be used. A sufficient number of spare vibrators shall be kept readily accessible to the place of deposition of concrete to assure adequate vibration in case of breakdown of those in use. Plain concrete also shall be vibrated whenever and wherever directed by Engineer-in-Charge to achieve full compaction, using needle and screed vibrators as necessary.

5.5.2.5 Curing

Curing shall be started at the earliest by spreading wet jute cloth (hessian) and cover top with impervious sheet and subsequently cured with spraying water. In inaccessible area to start with, curing be started by spraying curing compound before starting membrane curing. Cubes of 15cmx 15 cm x 15 cm size shall be cast on the first day and tested for compression at 7 and 28 days. Later on, if the Engineer so directs, 6 cubes shall be tested for every 50 cubic meters or part there of the concrete casted. The amount of water required for proper concrete consistency shall take in to account the rate of mixing, length of haul, time of unloading and ambient temperature conditions. Additions of water to compensate for slump loss should not be resorted to nor should the design maximum water-cement ratio be exceeded. Additional dose of retarder/plasticizer/superplasticizer shall be used with prior approval of Engineer to compensate the loss of setting time and slump at contractor’s cost.

5.5.2.6 Water Cement Ratio

Water cement ratio shall be carefully controlled throughout the work. This calls for a regular check on the equipment used for measuring water. The water cement ratio as determined of approved mix design shall be strictly adhered to.

5.5.2.7 Concrete placing

Concrete should not be dropped from a height greater than 1.5 meters. A properly constructed chute shall be used in such cases where it is necessary to exceed this height. Concrete must be thoroughly worked into the forms so that they are entirely filled, reinforcing bars adequately and tightly surrounded and entrapped air released from the mass of concrete. Placing shall be carried out by hand poking as well as vibrators. Concrete should not be moved through any considerable distance in the moulds, being consolidated as nearly as possible in the place where it is dumped. In casting beams or other deep sections concrete shall be laid in layers about 30cm, each layer being properly compacted.

5.5.2.8 Consolidation

All plain and reinforced concrete shall be consolidated by means of mechanical vibration. Adequate number of vibrators shall be used to ensure full compaction of concrete in about 10 minutes of placing. If needle vibrators are used, these shall be inserted at places not exceeding 0.5m apart until it is immersed to the full depth of concrete. Wherever possible shutter vibrators shall be used and the contractor shall design the shuttering so that this can withstand vibration. Care shall be taken to ensure that concrete is not over vibrated so as to cause segregation. In addition to mechanical vibration sufficient hand tools must be used to ensure full consolidation around reinforcement and at edge; and corners. All exposed faces of concrete shall be covered with Hessian, sand or similar materials which shall be kept continuously wet for a period of atleast7daysaftercasting.

5.5.2.9 Construction joints

Construction joints shall be made only where shown on the drawings or approved by the Engineer. Such joints shall be kept to the minimum and shall not be located in valleys. In case of columns and walls the joint shall be horizontal and 8 to 15 cm below the bottom of the beam or slab running into the column or wall head or below the anchor reinforcement of beam and slab coming into the column and wall and the portion of the column or wall between the stopping of level and the top of the slab shall be concreted with the beam or slab.

a) Vertical joints: At the end of any day's work or run of concrete the concrete shall be finished off against temporary shutter stopper which should be vertical and securely fixed. This stopper should be removed as early as the weather permits.

b) Horizontal joints: Horizontal joints should be washed down two hours after casting in the manner described above for vertical joints. If the concrete has been allowed to harden excessively, the surface shall be chipped over its whole surface to a depth of atleast 10 mm and thereafter thoroughly washed. Before fresh concrete is added on the other side of a construction joint, the surface of the old concrete will be thoroughly wetted and covered with a thin layer of cement mortar 1: 2 or epoxy bond coat as directed by the engineer

5.5.2.10 Testing

The following tests shall be carried out on the materials and concrete used in RCC work.

Material	Test	Field/ Lab Test	Test Procedure	Frequency	
				Quantity of Concrete	No. Samples
Reinforcement Cement Concrete	Slump Test	Field	Standard	Regular intervals during concreting as per mix design.	Regular intervals during concreting as per mix design.
	Cube Test	Lab	Standard	As per IS456:2000 clause15.2.2	As per IS456:2000 clause15.2.2

i. Slump tests: The slump tests shall be carried out from time to time as directed by the engineer on concrete actually being placed in the works at the commencement of each period of concrete placing in accordance with the procedure laid down in the latest Indian Standards Specifications.

ii. Cube tests: Whenever required by the Engineer but subject to the minimum Requirement given in the table above, cubes shall be made in a manner as laid down in the latest Indian Standards Code of Practice (IS:456) and sent to an approved laboratory for testing and the results submitted to the client immediately on receipt. The cost of all such tests made shall be borne by the contractor. At least 6 cubes will be taken on each day of concreting when a minimum of 5cum of concrete is laid or as instructed by the client. The contractor shall keep a record at site of all such tests identifying them with the portion of the work to which they relate. This record will be checked by the engineer from time to time.

5.5.2.11 Inserts and pipes

Inserts of any kind like fan hooks, sleeves, pipes, bolts and nuts, anchor, bolts etc. are to be accurately placed in the concrete (and/or brick work) and concreted over, as and when required and directed. The word “insert” will mean article like anchors beams, sleeves, pipes, bolts, nuts etc.

All electric conduits and junction boxes and all sanitary pipes, water supply pipes and down pipes that lie with in concrete slabs, beams or columns shall be laid in place and the client’s approval shall be obtained before the casting of concrete. No cutting of structural concrete will be permitted. All care shall be taken to ensure that conduit pipes are not damaged.

5.5.2.12 Formwork

Form work shall be erected true to the line and to the shapes required in the work with tolerances as per IS456-2000 and shall carry without deformation, the full weight of wet concrete and other live loads. It should also withstand the effect of vibration without deflection, building, distortion or loosening of its component parts. The contractor shall be responsible for the sufficiency of all formwork, centering and moulds; formwork shall be applied with releasing agent/oil for easy de-moulding wetted thoroughly before concreting. All form work, centering and shuttering used for concreting shall be rigid and straight, so as to produce all concrete members true to line.

Wire or similar items shall not be left in concrete having face exposed to weather. Bolts shall be permitted if they are greased/provided in sleeve pipe to allow for easy withdrawal and the holes subsequently made good. The formwork shall be designed so that the soffits of slabs and the sides of beams may be removed first leaving the form works to the soffit of beams and their

supports in position. Wedges shall be provided to allow accurate adjustment of formwork and its easy removal.

The boards shall be planned and straightened in order that the surface against the corner shall not be broken at joints between boards. All form work shall be coated with approved oil before it is fixed in position.

Cleanout holes shall be provided at the bottom of all columns and care shall be taken to remove any rubbish, woods having or any other foreign material before woods having or any other foreign material before concreting. Temporary supports shall be provided as required and/or ordered by engineer. The contractor shall provide steel/plywood form work in place of timber boarding wherever called for by the engineer.

Form work shall be designed and constructed to the shapes, lines and dimensions shown on the drawings with the tolerance given as per IS 456:2000. All formwork shall be kept in position until the expiry of minimum period after concreting as specified in IS:456-2000.

5.5.3 Reinforcement

All reinforcement bars to be used in construction shall be deformed high strength TMT (thermo mechanically treated bars) reinforcement bars of FE 500-grade of high yield strength and percentage elongation, as perIS:1786 and obtained from approved manufacturer.

5.5.3.1 Fabrication of reinforcement

Reinforcement shall be fabricated as per the drawing. Bending shall be done mechanically or with hand nut to the correct radius with proper tools and platform and shall conform to IS. Bending of material shall be cold bending only. Material shall be inspected for visible defect such as cracks brittle excessive rust, loose mill scale, etc. Cracked ends of bars shall not be used in works. Also, the bars should be free from any deleterious material and hence the best practice shall be to hose down reinforcement just prior to concreting.

It is important that bending straightening, cutting etc. shall be carried out in a manner not injurious to the material and the safety of the persons working. Anchoring of bars and stirrup shall be provided exactly as detailed in the structural drawing or as directed by Engineer.

5.5.3.2 Cover to reinforcement

Reinforcement shall have concrete cover and the thickness of such cover (excluding of plaster or other decorative finish) shall be as specified in drawing or as directed by the Engineer.

5.5.3.3 Fixing in Position

Correctly cut and bent bars shall be accurately placed in position as detailed in the drawing unless otherwise specified by Engineer. Reinforcement shall be positioned within the tolerance as under:

For effective depth 200mm or less +-10mm For

effective depth more than 200mm +-15mm

But in no case, shall the cover be reduced by more than 5mm of that specified. There shall be no compromise on cover for foundation work.

Reinforcing bars shall be held in position during placing of concrete by use of concrete cover blocks (made of equal strength of well cured concrete in use) steel chair spacers steel hangers, supporting wires, etc. and secured by trying with an annealed binding wire or 16 to 18 gauge as approved by Engineer-in-Charge.

5.5.3.4 Measurements

Reinforcement shall be measured as follows:

Lengths of different diameters of bars actually used shall be measured nearest to a centimeter and weight calculated. If steel is procured by the contractor; respective unit weight per meter shall be used for different diameter. If material is supplied by the owner on tonnage basis per meter weight for each diameter of the bar shall be fixed by the Engineer from actual stock available at site.

Wastage, laps, Chairs and spacer bars shall not be measured and paid. The contractor shall account for all these in his quoted price. In case of welded coupled points measurements for payment shall be equivalent to the Length of overlap as per design.

5.6 Concrete Block Masonry

Solid concrete blocks shall conform to the requirements of IS:2185-1979. The blocks shall be sound, free from cracks, broken edges, honeycombing and other defects that would interfere with the proper placing of block or impair the strength or performance of construction.

The nominal size of the blocks shall be as specified. The maximum variation in the length of the units shall be not more than +5mm and maximum variation in height and width of unit, not more than +3mm.

The Minimum compressive strength for solid concrete blocks should be 40kg/sq cm.

The drying shrinkage of the blocks (average of three blocks), when unrestrained, shall be determined in accordance with IS: 2185-1979 and shall not be exceed 0.1 percent.

The moisture movement (average of three blocks), when determined in the manner described in IS:2185-1979, shall not exceed 0.09 percent.

The water absorption (average of three blocks), when determined in the manner described in IS:2185-1979 shall be not more than10 percent by mass.

5.7 Flooring

5.7.1 Vitrified Tiles Flooring–Skirting/ Rectified Tiles flooring – Skirting

The specifications in respect of material and execution process for vitrified tiles and rectified tiles flooring and skirting shall be strictly in accordance with the description of items in the BOQ as under

Vitrified Tiles: Providing and fixing in position Premium quality mirror polished vitrified tiles in approved colour and shade conforming to IS15622 of approved make in floors, skirting, dados at all heights depths and levels laid over 20mm thick cement mortar bed 1:3 (1 cement: 3 coarse sand) including grouting the joints with white Epoxy matching colour including cost of all material, labour as per directions/approval of the Architect /Engineer.

Rectified Antiskid Tiles: Providing and laying rectified antiskid tiles of approved size & approved quality shade and brand in floors laid over 12mm thick cement mortar bed 1:3 (1cement: 3 coarse sand) including grouting the joints with Epoxy matching colour including cost of all material, labour as per directions / approval of the Architect /Engineer.

5.8 Finishing

5.8.1 CEMENT PRIMER COAT

Cement primer coat is used as a base coat on wall finish of cement, lime or lime cement plaster or on non-asbestos cement surfaces before oil emulsion distemper Paints are applied on them. The cement primer is composed of a medium and pigment which are resistant to the alkalies present in the cement, lime or lime cement in wall finish and provides a barrier for the protection

of subsequent coats of oil emulsion distemper Paints. Primer coat shall be preferably applied by brushing and not by spraying. Hurried priming shall be avoided particularly on absorbent surfaces.

5.8.1.1 Preparation of the Surface

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

5.8.1.2 Application

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

5.8.1.3 Mode of Measurement:

The measurement shall be in sq.m.

5.8.2 Interior Emulsion Paint

a) Materials

The emulsion paint and primers in general shall be of approved quality colour and shade.

b) Scaffolding

This shall be double as required and directed. If ladders are used, pieces of gunny bags of loth bags shall be tied on their tops to avoid damage or scratches to the plastered surfaces etc. Proper stage scaffolding shall be erected when painting the ceilings.

c) Preparation of the Surface

The surface to be painted shall be cleaned and all cracks, holes and surface defects shall be levelled with putty or the surface shall be prepared as specified in bill of quantities and with filler prepared.

d) Priming Coat

The priming coat of the approved shade shall be applied over the completely dry surface in the manner as recommended by the paint manufactures. The emulsion paint, in the priming coat, may be thinned down with 20% water or as recommended by the paint manufacture. Turpentine

or any other solvent shall not be used for thinning the paint.

e) Application of Emulsion Paint

The recommendation of approved paint manufacturer, whose product is used, shall be followed regarding the preparation of the surface and the application of the priming and finishing coat. The contractor shall arrange for technical assistance and supervision from the paint Manufacturer, during the execution of the painting work. After the priming coat has been applied and perfectly dried, all holes, scratches, if any shall be repaired as mentioned in preparation of surface and then the second coat of approved shade and manufacture shall be evenly applied and allowed to dry. The third coat shall be carefully supplied to achieve smooth and even surface after the previous coat has dried up. Minimum 3 coats of paint shall be applied inclusive of primer coat. If a proper and even surface is not obtained to the satisfaction of the Client in 3 coats, contractor shall carry out additional coats of painting to approval, at contractor's expenses. Care shall be taken that dust or other foreign materials do not settle or disfigure the various coats.

f) Rates to Include

Apart from other factors mentioned elsewhere in this contract, the rates for the item of plastic emulsion point shall include for the following:

i. All labour, materials and equipment necessary to carry out the work.
ii. Supplying the approved emulsion paint for priming and finishing coats.
iii. Repairing the surface and applying one or more coats of approved quality filler for receiving the primer and finishing coats.
iv. Scaffolding including its erection, dismantling
v. Application of one primer coat and minimum two coats of finishing. If a proper and even surface is not obtained to the satisfaction of Client, the contractor shall carry out additional coats of painting to approval at contractor's expense.
vi. Protection to painted surface till dried and handed over
vii. Expense, if any for supervision and technical assistance supplied by the approved paint manufacturers.

g) Mode of Measurement

The measurement shall be in sq.m.

5.8.3 External Acrylic Paint.

a) Material

External acrylic paint shall be of approved colour & manufacture as per makes/brands approved by Engineer /SIFL.

b) Preparation of surface

Before painting is commenced on surface, all dirt, oil, grease, efflorescence and organic material shall be completely removed by sand papering and rubbing and there after all cracks, holes and surface defects shall be repaired with White putty and allowed to set hard. All irregularities shall be sand papered smooth and wiped clean. The surface so prepared must be completely dry and free from dust before painting is commenced. In the case of the walls newly plastered special care shall be taken see that it is completely dry before any treatment is attempted.

c) Application

The instruction of the makers shall be followed regarding the preparation of the surface and application of priming and finishing coats. Paint shall not be mixed in a larger quantity than is actually required for days work. Normal water should be used to prepare the mixture. Paint shall be applied in dry weather with broad stiff brush in long parallel strokes. The treated surfaces shall be allowed dry and harden, Second or succeeding coats shall not be applied until the preceding coat has been passed by the Client. Two more coats of paint shall be given in exactly the same manner as the first one but only after the earlier coat laid has thoroughly dried.

d) Rates of include

Apart from other factors mentioned elsewhere in this contract, the rate of providing paint shall include for the following.

i. All labour, materials and equipment to provide paint.
ii. Scaffolding, including erecting and removing.
iii. Preparing the surface as stated above.
iv. Applying 2 finishing coat of approved paint. If a proper and even surface is not obtained to the satisfaction of the Client in the coats in the applied, the contractor shall provide additional coats of painting to approval, at contractor's expenses.
v. Curing as stated above.

e) Mode of Measurement

Measurement shall be in square metre. Nothing extra shall be allowed for painting on rough surface, for example, external sand faced plaster/rough cast plaster etc.

5.8.4 UPVC Doors, Windows and Ventilators

a) Material

Polyvinyl chloride Resin suspension grade is the basic raw material for forming PVC compound. PVC resin then is mixed with chemicals like Calcium, Stearate, Hydrocarbon Wax, Titanium Dioxide, Calcium Carbonate, Acrylic processing aids. Further, additives like impact modifiers, pigments, epoxy plasticizer, UV stabilizer, lubricants, chemical blowing agent etc. are added. The purpose of adding the chemicals and additives is to impart cellular structure, strength, surface finish, colour and resistance to fading by light rays. These chemicals are mixed in the desired proportion and shall be used in the formulation of PVC material and for free and smooth extrusion of PVC profiles.

b) Fabrication

The frames are to be fixed in prepared openings in the walls. All civil work and tiling should be completed before the fixing of the frames. The frames are to be fixed directly on the plastered wall. Incase tiling is to be done in the place the frames are to be fitted, a 50 mm strip should be left untiled at the location where the frames are to be fitted. The frames are erected in the prepared opening such that the vertical members of the door frame are embedded 50 mm in the floor. The frame shall be fitted truly in plumb. A minimum of three anchor bolts or screws of size 65/100 shall be used to fix each vertical member. One bolt shall be fixed at 200 mm from the top member and one bolt shall be fixed at 200 mm from the floor. The third anchor bolt shall be fixed in the center. The top horizontal member shall be fixed using two 65/100 size anchor bolts or screws at a distance of 200 mm from both the corners.

c) Measurements

Measurements shall be in square meter. Glass shall be measured as a part of windows or doors.

5.8.5 M. S. Grills,

M. S. Grills shall be fabricated and fixed in position strictly as per design and drawings. All inter section or meetings of all members shall be welded and the workmanship shall be high grade quality to the entire satisfaction of the client. After fixing in position, these shall be cleaned off dust, rust or scales and rubbed with emery and unless otherwise specified a steel priming coat with enamel paints shall be applied. The rate for M.S. Grills to window where required shall also include the cost of screws to be used for fixing. The rate is for the completed work in all respects.

5.8.6 Glazing

Plate glass shall be flat, transparent and clear when judged by the unaided eye. It may however possess a tint when viewed edge-wise. It shall be free from cracks, blisters, stones, scratches; bubbles sheet glass shall not show any distortion of light when tested to Indian Standard. Plate glass shall not have defects greater than those given in Indian Standard. Test shall be conducted as specified in Indian Standard. Classification of glass shall be as per Indian Standard.

5.8.7 False Ceiling

False ceiling shall be of 12mm thick tapered edge gypsum board conforming to IS2095 part I with frame work made of special sections power pressed from M.S sheet and galvanized in accordance with zinc coating of grade 350 as per IS:277 and consisting of angle cleats of size 25mm wide x 1.6mm thick with flanges of 22mm and 37mm at 1200mm centre to centre one flange fixed to the ceiling with dash fastener 12.5mm dia x 40mm long with 6mm dia bolts to the angle hangers of 25x25x0.55mm of required length and other end of angle hanger being fixed with nuts and bolts to G.I. channels 45x15x0.9mm running at the rate of1 200 mm centre to centre to which the ceiling section 0.5mm thick butt on wedge of 80mm with tapered flanges of 26mm each having clips of 10.5mm at 450mm centre to centre shall be fixed in a direction perpendicular to G.I. channel with connecting clips made out of 2.64mmdia x 230mmlong G.I. wire at every junction

Including fixing the gypsum board with ceiling section and perimeter channels 0.5mm thick 27mm high having flanges of 20mm and 30mm long, the perimeter of ceiling fixed to wall/ partition with the help of rawl plugs at 450mm centre to centre with 25mm long drive-all screws @ 230mm interval including jointing and fixing to a flush finish of tapered and square edges of the board with recommended filler, jointing tapes finisher and two coats of primer suitable for board as per manufacturers specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts, made with frame of perimeter channels suitably fixed including cost of all materials, labour, machinery, T & P, sampling and testing with all leads, lifts, and delifts, for all materials complete in all respects as per drawings, requirements, specification and as directed by the Architects/Engineer.

5.8.8 Other Items

All materials to be used and workmanship for all the other items (not covered above) but taken

and described in the BOQ including items beyond BOQ shall also be the best of its kind and shall be conforming to the CPWD specifications and latest Indian Standard Specifications in every respect and to the approval of the Engineer/Architect /client.

All materials or workmanship which in the opinion of the SIFL are/ is defective/under specifications or un-suitable, shall be remove immediately from the site and shall be substituted with proper material and / or workmanship forth with as per drawings, requirements and as per approval/directions of the SIFL.

All material shall be of approved quality, brands / makes as per list preferred makes and as per sample got approved from the SIFL.

6. TECHNICAL SPECIFICATIONS FOR WATER SUPPLY, SANITARY AND DRAINAGEWORKS

6.1 Plumbing & Sanitary Works

The general character and the scope of works to be carried out under this contract is illustrated in the drawings and specifications attached here with. The contractor shall carry out and completes the said work under this contract in every respect in conformity with the rules and regulations of the local authority. The contractor shall furnish all labour, supply and install all materials appliances, tools, equipment necessary for the complete provision and testing of the whole plumbing and services installation as specified herein and as per the relevant ISI codes and shown on the drawings. This also includes any material, appliances, equipment not specifically mentioned herein or noted on the drawings as being furnished or installed but which necessary and customary to make complete installation as shown on the drawings or described here in properly connected and in working order.

In general, the work to be performed under this contract shall comprise of the following.

All incidental jobs connected with plumbing services installation, such as excavation in trenches and back filling, cutting chases in concrete and brick and making good, cutting/ drilling holes through walls, floors and grouting and for fixing of fixtures equipment etc.,

Furnish and install a complete workable, plumbing services installation as shown on the drawings and described in this specification and as per the latest ISI specifications including all that which is reasonably inferred.

Complete installation of internal and external water supply system. Complete installation of sewerage and sewerage appurtenances internally as well as around the building.

Complete installation of all sanitary and plumbing fixtures. Cooperation with other crafts inputting the installation in place. Any work done without regard or consultation with other trades, shall be removed by the contractor without additional cost to the SIFL to permit proper installation of all other work, as desired by the client.

Repair all damages done to the premises as a result of this installation and remove all debris left by those engaged for this installation to the satisfaction of SIFL.

Cleaning of plumbing fixtures, showing the satisfactory performance of all the fixtures at the

time, the building is handed over to SIFL.

It is the responsibility of the contractor to take care of all the fixtures fitted until the time of handing over to SIFL. Painting of all concealed and exposed pipes if as specified.

6.1.1 Regulation and Standards

The installation shall conform in all respects to the following broad list of standards in general.

IS 1726- 1960-Code for cast iron man hole and cover

IS1742-1960-Code for practice building drainage

IS2064-1962-Code of practice for selection, installation & Maintenance of sanitary appliances.

IS 1172-1971-Code of basic requirements for water supply drainage & sanitation (revised).

IS 2065 - 1963 - Code of practice for water supply in buildings.

IS 4985-2000-Code of practice for laying PVC pipes.

IS 4111 - 1967 -Code of practice for ancillary structures sewerage systems.

IS 4127-1967-Code of practice for laying glazed stoneware pipe.

IS7834-1998- Code of practice for fitting of PVC specials

IS3989-1970-Centrifugally cast spun iron & socket soil & ventilating pipe, fittings &accessories.

IS1239-1968-Specification of mild steel tube, tubular and part-I other steel pipe fittings.

IS 1239 - 1969 -Specification for mild steel tube, tubular and

Part II and other steel pipe fittings.

IS651-1965-Specificationfor salt glazed stone ware pipes and fittings (first revision)

The installation shall also be in conformity with the bye laws and requirements of the local authority in so far as these become applicable to the installation. Wherever these specification calls for higher standard of materials and / or workmanship than those required by any of the above regulations and standards, then the specifications hall take precedence over the said regulations and standards. Wherever drawings and specifications require something which will violate the regulations, the regulations shall govern.

6.1.2 Fees-Permits and Tests

The contractor shall obtain and pay for all fees and permits required for installation of this work. The owner shall have full power to require the materials or work to be tested by an independent agency at the contractor's expenses in order to prove their soundness and adequacy.

6.1.3 Drawings and Specifications

The drawings and specifications shall be considered as part of this contract and any work or materials shown on the drawings and not called for in the specifications or vice versa shall be executed as if specifically call for in both. The contract drawings indicate the extent and general arrangement for the fixture drainage systems and are diagrammatic. The drawings indicate the points of supply and termination of pipe runs and broadly suggest the routes to be followed. The work shall be installed as indicated on the drawings, however any changes found essential to coordinate this work with other trades shall be made without any additional cost. The data given here in on the drawings is as exact as could be secure, but its complete accuracy is not guaranteed. The drawings and specifications are for the assistance and guidance for the contractor, and exact location, distance and levels will be governed by the individual building and site condition. Therefore, approval of the client shall be obtained before commencement of work. After completion of the work, the contractor shall furnish necessary information like- invert levels and layout of pipe line etc., and prepare final completion drawings and hand over to the owner .

6.1.4 Manufacturer's Instructions

Where manufacturers have furnished specific instructions, relating to the materials issued in this job, covering points not specifically mentioned in this document, instructions shall be followed in all cases.

6.1.5 Change in Dimensions

If the size of fixtures mentioned is not available then nearest available size shall be fixed with due considerations of the SIFL.

6.1.6 Materials

Materials shall be of the best approved quality obtainable and unless otherwise specified, they shall conform to the respective Indian Standards specifications.

Samples of all materials shall be as per the list of approved brand manufacture which shall be got approved before placing order and the approved samples shall be deposited with the owner. For purchases coming under the contractor shall furnish a blank copy of order placed with the supplier.

In case non-availability of materials in metric sizes, the nearest size of FPS units shall be provided with prior approval of the client, for which no extra amount will be paid

6.2 Drainage

6.2.1 Sewer Appurtenances, Inspection Chambers and Manholes

Size of Chambers & Manhole: The size given in bill of quantities and drawings shall be internal size of chamber. The work shall be done strictly as per standard drawing and following specifications.

6.2.2 Chamber/Manhole Covers

Covers shall be of medium duty concrete with lifting hooks details given in the drawing and fixed on the C I frame embedded in concrete. Cover placed on the frame shall be air tight. Weight of the cover on frame shall be as specified in the schedule of quantities.

6.2.3 Gully Trap Chambers

C.I. gully traps of specified size shall be provided. It shall be fixed on 15 cms thick and 70 cms square1:5:10 cement concrete bedding and the gully outlet shall be jointed similar to the jointing of stoneware pipes. A brick masonry chamber 300x300 mm (internally) shall be constructed in ½ brick masonry with 1:5 cement mortar and the spaces between the trap and the wall shall be filled up with 1:3:6 concrete and upper portion of the chamber shall be finished with neat cement. The corner and the bottom of the chamber shall be rounded off so as to slope towards the grating. The clear space between the top of the grating and the bottom of inspection cover shall not be less than 230 mm. In addition to 15cmx15cm C.I grating the chamber shall have addition and C.I. FRAME COVER (30 cmX30 cm). It shall then be placed on the top of brick masonry.

6.2.4 Mode of Measurement

The inspection chambers shall be measured per number and the rate quoted also shall be number only. The quoted rate shall include the cost of all the items, specified in the bill of quantities and specifications viz.

6.2.5 Sanitary Installation and Fixtures

All fixtures shall be fixed in neat workmen like manner true to line and as recommended by the manufacturer or shown on the drawings. Care shall be taken to fix all fixtures, brackets and accessories by proper wooden cleats, rawl plugs, bolts and nuts, as such fixtures will warrant with the correct size of screws nuts and bolts.

Care shall be taken in fixing all chromium plated fixtures and accessories so as not leave any tool marks or damages on the finish. All such fixtures shall be tightened with fixed spanners.

All fixtures shall be thoroughly tested after connecting up the drainage and water supply system. All fixtures shall be thoroughly finished and any leakage in piping, valves and waste fittings corrected to the entire satisfaction of the client.

Upon completion of the work all labels, stickers, plasters etc., shall be removed from the fixtures and all fixtures cleaned thoroughly with soap water, so as present a neat and clean toilet.

6.2.6 Mode of Measurements

All the items above shall be measured per number and quoted rate per number only which shall include:

- The cost of respective materials
- Necessary fixtures
- Fixing in positions

6.3 Sanitary Installations

6.3.1 European Water Closet

It shall be of best quality white chinaware water closet suite ‘P’ or ‘S’ trap confirming to IS: 2556 with ISI marked, vitreous chinaware 10 ltr capacity cistern with original fittings and all the CP brass fittings and other items required as specified in the Item No.1European type water closet shall be fixed with brass screws of suitable length to PVC plugs embedded in the floor after drilling hole in floor. Design to be approved by SIFL

6.3.2 Urinals

The urinals shall be of white or coloured vitreous chinaware conforming to I.S.2556 Part VI. Section-I It shall be flat back half stall urinal as specified. It shall be provided with push cock for flushing, CP brass waste dome grating and other CP brass fitting and other fittings as specified in respective item of urinals. design to be approved by SIFL

6.3.3 Wash Basin

Best quality washbasin shall be of white vitreous chinaware (or coloured) with CP brass pillar tap (pushtype) as specified in the Items. It shall be provided with 1st quality vitreous chinaware pedestals where so specified. Pedestals shall accommodate supply and waste pipes fittings. The wash basin shall be placed on pedestal and firmly fixed on wall using nut-bolt & washers. All the waste fittings shall be brass chromium plated as specified. Design to be approved by SIFL

6.3.4 Partition Plate

It shall be best quality 18-20 mm thick granite partition plate size 600x1200 mm as specified in the BOQ. It shall be fixed with cement concrete 1:2:4 supporting with CI/MS special types brackets and cutting/ making good the walls.

6.3.5 Sink

Kitchen sink with drainage board shall be of stainless steel (Stainless Steel IS:304) 1mmthick. The sink and drainage board shall be in one piece as specified size with rectangular compartment/ bowl. Each sink shall be provided with one stainless steel waste and GI ‘B’ class wastepipe. Sink shall be supported on RCC platform having suitable cut for the bowl of the sink.

6.3.6 Towel Rail

CP brass towel rail rod 20mm dia 16 gauge 450 mm long including CP brass brackets.

6.3.7 Soap Dish

Best quality make chinaware coloured recessed type soap dish/ cake holder. The colour should match with the tiles.

6.3.8 PVC Soil, Waste and Vent Pipes and Fittings

PVC soil, waste and vent pipes Class-3 and fittings (PVC specials) shall be of heavy quality conforming to I.S. 4985-2000 for PVC pipes and PVC fittings conforming to IS 7834-1998. The standards weights and thickness of pipes shall be as per I.S. codes.

All soil waste and vent pipes shall be carried above the roof (90 cms beyond the tops of parapet.) and fitted with PVC terminal guard at top. The pipes shall have with coupler. The pipes and fittings shall be true to shape, smooth and cylindrical. Their inner and outer surface shall be concentric. They shall be sound and be free from cracks, taps, pinholes and other imperfections. The pipes and fittings shall ring clearly when struck over with a light hand hammer.

6.3.9 Fixing

The pipes and fittings (specials) shall be fixed to walls atleast 2.5 cm clear of the finished surface of wall by using proper PVC clamps. Pipes shall be fixed vertically in a line as directed. Connection between main pipes and branch pipes shall be made by using proper bends in variably with access doors for cleaning.

All PVC pipe fittings like bends, tees, heal rest bend, single junction with door etc. in soil waste &vent pipes shall be ISI marked

6.3.10 Joining

Jointing the pipes and specials with solvent cement complete as per requirement.

6.3.11 Floor Traps

Floor traps shall be PVC, deep seal with an effective a seal of 50mm. these shall be ISI marked. The trap and waste pipe shall be set in cement concrete blocks firmly supported on the Ground Floor. The blocks shall be cement concrete 1:2:4 and extended to 40 mm below finished floor level and size of the blocks shall 300x300 mm and of required depth. The floor trap shall be 100 mm dia inlet and 75mm dia outlet. Floor traps shall have extension piece to receive waste lines as indicated in the plan. All floor traps shall be provided with CP brass tap roach trap round of approved design and shape.

6.4 Internal Water Supply

6.4.1 GI Pipes and Fittings

The pipes shall be of medium quality (Class-B) and shall be galvanized iron, screwed socketed and shall conform to IS 1239. They shall be manufactured by a firm of repute. All fittings shall be malleable iron galvanized fittings of approved best Indian make.

Where pipes have to be cut or re-threaded, ends shall be carefully filled out so that no obstruction to bore is offered. For internal work all pipes and fittings shall be fixed truly vertical and horizontal, either by means of standard pattern holder bat clamps keeping the (12 mm) clear of the wall everywhere or concealed as directed. For external work, G.I. Pipes and fittings shall be laid in trenches. The width of the trench shall be the minimum width required for working. The pipes laid underground shall not be less than 60 cms from the finished ground level. The work of excavation and refilling shall be done as specified elsewhere, or concealed as directed.

6.4.2 Testing

Before any pipes are painted or covered, they shall be tested to a hydrostatic pressure of 7 kg/cm2. Pressure shall be maintained for at least eight hours without appreciate drop in pressure. In addition to the sectional testing of water supply pipes, the contractor shall test the entire installation to the entire satisfaction of client. He shall rectify any leakages, failure of fittings or valves.

6.4.3 Mode of Measurement

pipes above ground shall be measured along the centre line of the pipes and fittings. The quoted

rate for respective item shall be per running metre and shall include the following:

- Cost of respective pipes and specials
- Laying, fixing and jointing with necessary clamps
- Cutting holes and chases in walls, floors etc. and making good the same.
- Testing and making good the defects if any

6.4.4 Water Fittings(Taps Stop taps, Etc.,)

All water fittings shall be of approved quality and design and generally comply to latest I S specifications. The fittings and joints shall be tested as specified for pipeline to ensure that the joints are leak proof. Defective fittings and the joints shall be replaced as directed.

These items shall be measured in number, unless not included in other items viz.

- Wash basins Inlets to cisterns, etc...
- Cost of materials
- Cost of fixing accessories like bolts, nuts, washers

6.4.5 All Taps

Ball taps used for storages tanks shall be high pressure brass/GM. Ball taps with brass lever rods and PVC floats. Measurements Ball taps shall be measured by the number.

6.4.6 Ball Valve

It is required to be provided in the overhead tank at end G.I. pipe. It will conform to IS 1703. The ball valve shall be of brass (as specified) of required diameter. The float shall be of polythene. The body of ball valve shall be capable of withstanding a pressure of 14-kg/sqcm. A ball valve when assembled in working condition with float immersed to not more than half of its volume shall remain closed against a test pressure of 10.5kg/ sqcm. The standard weights of ball valves shall be as given in the I.S. standards.

6.4.7 Bib Tap

All bib taps short body, long body, bottle traps, spray jet and copper pipe connection and other minor fittings shall be brass chromium plated. These shall be ISI marked. For fixing of CP brass fittings wherever required CP brass extension piece shall be provided.

6.4.8 Rain Water Pipes & Spouts

The rainwater pipes where shown on the drawings shall be PVC pipes (Class-3) of the diameter a specified in the schedule of quantities/drawings of approved manufacturer confirming to IS-4985 with coupler

Where required these are to be run in the chase left or cut in wall, columns, slab. For exposed lengths of pipes these are to be neatly secured clear from the finish wall face with clip or bracket, nailed or screwed to hard wood tapering plugs embedded in walls.

The mouth of the rainwater pipe shall be fixed with PVC grating and the pipe jammed in position in 1:2:4cement concrete.

The rate for the work shall include supplying and fixing of materials cutting, making chases etc. and is for the complete work in all respects. Unless otherwise specified in the schedule of quantities, the rate shall also include supplying, fixing and jointing all the specials like bends tee, junction etc. required for the complete work.

7. GENERAL SAFETY PRECAUTIONS TO BE FOLLOWED AT WORKSITE DURING EXECUTION

The following safety measures should be strictly adhered to during execution of works at sites.

1. Providing the working platform with toe board and hand rail for continuous working at heights.
2. Providing safety belt and life line at all times for men working at heights.
3. Providing dust or fume respirator in places where dust and fume concentration exists.
4. Providing goggles and welding screens.
5. Providing acid and alkali proof rubber gloves for handling acid and alkali and chemical which are corrosive.
6. Providing rubber gloves for working on electrical works.
7. Ensuring proper lashing of the components while being transported in vehicles.
8. The vehicles must have side supports or have body to support the materials conveyed.
9. The materials should not be allowed to extend or overflow the sides of the vehicles.
10. Materials should not be allowed to overhang from the rear edge of the body of the vehicle.
11. Driver of the vehicle must possess license.
12. Vehicle must not be overloaded prescribed limits.
13. Red flags and lights for parts projecting from the body of vehicle must be provided.
14. The speed restrictions within the factory premises must be strictly adhered to.
15. The gas cylinders must be always handled on trolleys or kept tied down not in use. They should never be rolled as Roller for conveying.
16. Cylinders should not be used without regulators.
17. All excavations must be barricaded and red lamps /tapes must be provided.
18. All electrical connections must be properly earthed.
19. No work should be taken up for execution inside shop floor, without obtaining necessary work permit.
20. Providing helmet, safety belt, safety shoes etc., for high level work and sufficient number of Industrial Safety nets at appropriate level to safeguard the persons working at high level particularly in trusses, girders, roofing etc. of industrial and high roof buildings.
21. The contractor should maintain a register regarding the driver license particulars.
22. All personal protective equipment conform with standard specification as per the details given in the code of conduct.

Contractor including their sub-contractors, agents and labour engaged on the work are required to scrupulously adhere to the safety regulations, safety precautions and measurers. Any violation thereof will invite punitive action being taken against them. Also, contractors with frequent violations of safety regulations will not be entrusted with further work in this organization.

CONTRACTOR ACCEPTING OFFICER

8. SAFETY PRECAUTIONS TO BE OBSERVED WHILE TRANSPORTING MATERIALS

I. VEHICLE

1. Vehicles carrying material should have proper registration documents and must be produced on demand by our Security Staff.
2. The light on right side, i.e., over the driver's cabin shall be in working condition.
3. Both the headlights as well as park lamps must be in working conditions.
4. The vehicles should have valid smoke emission test conducted before entering the site premises and should the same should be produced to security/safety personnel if required.

II. MOVEMENT OF VEHICLE

1. The vehicle should not travel at more than 20kmph in our premises.
2. The Driver of the vehicle must possess heavy duty license and produce on demand by the Security Staff.
3. The driving should 'KEEP TO THE LEFT' at all places.
4. The vehicle should not be parked in road which could obstruct the vehicular traffic.
5. No person other than driver should be allowed to sit or stand on the prime mover or trailer.
6. The vehicle should pass only through the approved routes. Shortcuts should be forbidden.
7. There must be a safe distance behind another moving truck.
8. The driver should avoid making quick starts, jerky stops or quick turns at excessive speed.

9. SCHEDULE OF QUANTITIES & APPROVED MAKES

LIST OF PREFERRED BRANDS/MAKES FOR ITEMS

The materials of first/standard quality from the following approved makes or as specified in the particular item of work in the Schedule of Quantity are to be used. In case it is established that the brands specified below are not available in the market, contractor shall submit alternative proposal for the approval of Engineer-in-charge/client.

Sl. No.	Description	Approved Manufacturer/ Brand Name
A&B.	**CIVIL&PLUMBINGWORKS**	
1	Primers, paints & distemper	Nerolac, Asian, Berger, Jensons & Nicholson
2	MS Windows	SKS, Raymus, Metal Window Corporation
3	Chequered Tiles	Modern, Nitco, Gem, Eurocon
4	Sanitary Wares	Parryware, Hindware, Jaguar, Cera
5	Bevelled edge mirror	Atul, Jolly, SaintGobain, Modiguard
6	CI spun pipes	NECO, Kesoram, Electrosteel or equivalent
7	G.I. Pipes	Tata, GST, Jindal Hissar or equivalent
8	G.I. Fittings	Unik, R,KS or equivalent
9	Brass/CP Brass fittings	Jaquar, Kingston, Gem, Marc, Universal
10	Stainless steel sink	AMC, Orient, Sushag, Neelkanth, Cobra or equivalent
11	Automatic Flushing Cistern	Utech–m Toshi, Parryware, Hindware, Seabird, Jaguar
12	Plastic W.C. seat cover	Commander, Diplomat, Bestolite or equivalent
13	C.P. Accessories	Jaquar, Kingston, Gem, Marc, EssEss, Universal or equivalent
14	Gun metal Valves (Fullway Check & Globe Valves)	Leader, G.G.Saint, Zoloto, Burn Botteries Jabalpur or equivalent
15	C.I.S/S pipes	NECO, Kesoram, Electrosteel or equivalent

16	C.I. double flanged sluice Valves	Kirloskar, IVC, Burn or equivalent
17	C.I. double flanged non Return Valves	Kirloskar, Leader or equivalent
18	C.I. Manholes	B.C.,R.I.F. Neco or equivalent
19	Vitrified Floor Tiles	Somany, Kajaria, Johnson, NITCO
20	Vitrified wall Tiles	Somany, Kajaria, Johnson, NITCO
21	Cement	FOR RCC – (Ultra-Tech, Ambuja, India Cement) FOR OTHER WORKS – (Ultra-Tech, Ambuja, India Cement, ACC, Dalmia, Malabar, JSW)
22	Mortice Latch	Godrej, Harrison
23	White cement	Birla White, J.K. White
24	Putty	Shalimar, Birla Whiten, Asian
25	Sand Cast Iron (S&S pipes & Fittings)	H.I.F.,R.I.F. or equivalent
26	G.I. fittings	'R' Brand, Unik, Zoloto-M. or equivalent
27	Aluminium Sections (Anodising by approved Anodising Firm)	Hindalco, Jindal, Indian Aluminium Co. Mahavir sections.
28	Water Proofing compound	ROFF,FOSROC,MAPE, FOSROC, Sika
29	Acid Resistant tiles.	BELL, GRANAMITE, Naveen
30	W.C.& Wash Basin 1.0mm thick stainless steel	AMC, Jayco, Nirali or equivalent.
31	Glass Sheets	Modi, Saint Gobain, Atul or equivalent
32	Steel Section Windows (ISI Marked)	Metal Window Corp, Gurjeet Industries or equivalent.
33	C.P. waste spreaders urinal Flush pipes	Lotus, Orient, Ess-Ess.
34	UPVC soilwaste & Vent. Pipes and fittings	Supreme, Prince, Finolex or equivalent

38	Steel Fibre Reinforced Concrete Manhole cover and grating	K.K. Manholes Pragati Concrete. or equivalent
39	Acrylic smooth Exterior paint	(Trump)M/s Snowcem India Ltd., Asian, Berger Nerolac
40	Thermo Mechanically Treated Steel Bars	SAIL,VIZAG, TATA TISCON
41	Ply wood & Laminates	Green Lam, Century
42	Hardware & Fittings	Sleek, Hettich, Hafele
C.	**ELECTRICAL WORKS**	
1	HT Vacuum Circuit Breaker	Megawin/ABB/Schnieder
2	HT & LT Cables(XLPE)	Rallison/Gloster/Havells/Finolex/Polycab
3	Relay & Controls	L&T/Kappa/Schnieder/Conzerv/ABB
4	Current Transformer (CT) & PotentialTransformer (PT)	AE/Intrans/Kappa/Indus
5	MCCB's & ELM/EFR	Legrand/L&T/ABB/Schnieder
6	Battery Charger	V Guard/Philips/Equivalent
7	LTACBs	Legrand/L&T/ABB/Schnieder
8	Indicating Meters	L&T/MECO/AE/HPL Socomec/Conzerv
9	Energy(KWH)Meters, KW/ KVA Meters/ TODMeters	L&T/MECO/AE/Conzerv
10	MCB,ELCB,RCCB,RCBO,MCB type Isolator	Legrand/Siemens/ABB/Indo Asian Gold Plus, Anchor
11	PVC conduit & accessories	Precision/Konseal/Balco/A1Plast/Geo
12	Modular type switch / socket / telephone socket / electronic stepped fan regulator /internet jack/TV socket/blanking plate/G.I. or UPVC box, base and coverplate	Legrand/MK/Siemens/Anchor
13	Wire-FRPVC insulated single core stranded copper/ three core flexible cable	Finolex/RRKabel/VGuard/BCH/Indoasian

14	Paired Telephone cables & RG-6 grade TV cable	Finolex/RRKabel/VGuard/BCH/Havells/Indo asian
15	Light fixtures:(Indoor)	Philips/Bajaj/Crompton Greaves/Wipro
16	Electric Ceiling fan	Usha/Bajaj/Orient/Crompton Greaves/ Khaithan
17	Wall fan & air circulator	Usha/Bajaj/Khaithan
18	Exhaust fan/fresh air fan/air circulator etc.	Almonard/Bajaj/Crompton Greaves
19	Light fixtures: (outdoor,street&sports)	Philips/Bajaj/Crompton Greaves/Megalux
20	Street light poles	Philips/Bajaj/QSP
21	Industrial Plugs/ Metal clad Sockets/Metal Enclosures for MCB/ MCCB	Legrand/ABB/Siemens/Indo Asian Gold Plus/Anchor
22	Ceiling roses, Batten Holder, Angle batten, Pendant Holder	Precision/Ponds/CPL/Anchor/Elleys
23	Distribution boards (DB)-SPN/ETPN/ VTPN/MCCBDB's	Legrand/Siemens/ABB/Indo Asian Gold Plus/Anchor
24	FN/SFU/SDF/MDF/Isolator/Cha ngeover/HRC	L&T/Legrand/Siemens/ABB/Anchor
25	Weather proof boxes / SMC Sheets pole mounted boxes,Cable junction boxes etc.	Syntex/Hensel/Equivalent
26	Capacitors/Capacitor bank panels	L&T/ABB/Conzerve
27	Compact Bus	L&T/ABB/G.E./Schnieder/Godrej
28	Time Switch/Timer/Power Contactor/Starters	Legrand/Siemens/L&T/Anchor

NOTE:

1. The Contractor shall supply ISI marked material as per the makes or brands indicated above. In case the firm is not manufacturing ISI marked material for any of the brands, first quality material shall be accepted. The samples including make and brand of the material shall in either case have to be got approved from the Engineer in Charge

2. The contractor shall provide the materials as per the make or brand indicated above. When two or more alternatives/ Brands have been mentioned, the Brand to be finally used shall be as decided by the Engineer-in-Charge.

3. Material where no make/ brand has been mentioned, ISI marked samples shall be submitted by the Contractor for approval of Engineer in Charge. For those class of materials, where no firm exists with ISI approval, sample of first quality material of the firm shall be submitted for the approval of the Engineer in Charge.

4. Any variation from the above mentioned makes/brands will require specific approval of the Engineer in Charge.

5. It will be contractor's responsibility to ensure the quality of products listed in approved list of brands. Contractor will have to replace the defective and substandard materials at his own cost.

For
STEEL & INDUSTRIAL FORGINGS LTD.

Sd/-
MANAGING DIRECTOR