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Tender No.	1119
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Issued to M/s. \_\_\_\_\_

## **UTI INFRASTRUCTURE TECHNOLOGY AND SERVICES LTD., DELHI**

**Address:** Jeevan Tara Building, Ground floor, 5, Parliament Street, Near Patel Chowk, New Delhi - 110001.

**Tel No:** 011-23747289. **Fax:** 011-23741280

**Name of work:**

### **PLUMBING WORKS TO BE CARRIED OUT AT THE OFFICE PREMISES OF PUNJAB & SIND BANK, 21, RAJENDRA PLACE, NEW DELHI**

<b>Estimated amount</b>	<b>:</b>	<b>Rs 15,80,000.00</b>
<b>Last date of submission of tender</b>	<b>:</b>	<b>03.00 p.m. on 10-02-2015</b>
<b>Date of opening of the Tender</b>	<b>:</b>	<b>03.30 p.m. on 10-02-2015</b>
<b>Venue of the Tender opening</b>	<b>:</b>	<b>UTI Infrastructure Technology and Services Ltd., Jeevan Tara Building, Ground Floor, 5 Parliament Street, Near Patel Chowk, New Delhi 110001 Tel No. 011-23747289 Fax No. 011-23741280</b>
<b>Validity of Tender from the date of opening</b>	<b>:</b>	<b>60 days</b>
<b>Time of commencement from the Work Order date</b>	<b>:</b>	<b>Immediately</b>
<b>Stipulated time of Completion</b>	<b>:</b>	<b><u>Within 45 days from the date of Work Order.</u></b>
<b>Documents to be provided</b>	<b>:</b>	<b>i) CAR policy and workmen compensation insurance policy during the contract period from approved General Insurance company within 3 days from the date of issue of LOI. Indemnity regarding Central Excise Payments, &amp; Agreement within 7 days from the date of letter of Intent (LOI).</b>
<b>Earnest Money Deposit</b>	<b>:</b>	<b>Rs. 30, 000/- (Rupees Thirty Thousand only) in favour of "UTI Infrastructure Technology and Services Ltd.", payable at Delhi.</b>

Contractor's Signature

Seal

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## UTI Infrastructure Technology And Services Ltd.

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Special Conditions

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# **UTI Infrastructure Technology And Services Ltd.**

## **Tender Notice**

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On behalf of our client, we hereby invite sealed tenders for the above work as per the enclosed schedule of quantities, specification, list of materials and as per the terms and conditions spelt out in this notice:

### **A. Submission of Tender :**

Tenders in sealed covers superscribing “**works and Client ID as mentioned on the cover page (Page no.1) of the tender**” and quoting the reference number of the letter forwarding this notice should reach the office of, UTIITSL as mentioned on the cover page of the tender.

- a) All entries in Tender document must be made in ENGLISH. It must be hand written in INK and must NOT be typed. The rate column to be filled in both figures and words against each item . Amount column to be filled for each item and the total amount for each trade/part to be given.

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*NOTE : 1) The contractor / tenderer means the person / the firm / the agency who is participating in the contract bid which shall also include their Legal Representatives, Successors, Hirers and Assignee of the firm.*

*2) Consultant means UTI Infrastructure Technology And Services Ltd. having their office at ground floor, UTI-Tower, Gn Block, Bandra-Kurla Complex, Bandra (E), Mumbai – 400 051. Ph. No.022-66786205/6115 Fax No. 022-66786005/6364.*

*3) Engineer-in-charge means, the Engineer/ advisor/ consultants/ specialized agency/ person appointed by the UTI Infrastructure Technology And Services Ltd. who will be supervising the work, certifying the bill and who will also be responsible for the entire project.*

Only the Tender form issued by UTIITSL or downloaded from the website should be used.

- 4) The tender document is available free of cost on our website i.e. [www.utiitsl.com](http://www.utiitsl.com) and on Government website [www.tenders.gov.in](http://www.tenders.gov.in). The tenderer can also collect the tender form from our office on payment by paying demand draft / pay order of any Nationalised Bank/ approved scheduled Bank as mentioned. The tenderer is requested to download the complete tender document from our website as given above and take the printout of the complete tender document and submit the same duly signed on all pages.

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As far as possible corrections in the tender documents to be avoided. However in case of any corrections, the same should be authenticated by the person who is signing the Tender. Over writing on the tender document is not permitted. No additions or alterations are to be made by the tenderer to the text or the schedule of these tender papers. If made, they will be considered invalid.

The Tender should be forwarded in the official letterhead of the tenderer.

5. The complete Tender documents (duly signed tender conditions, specification, priced bill of quantities etc.) should be addressed to “ **The Divisional Manager, UTI Infrastructure Technology And Services Ltd. (UTIITSL), Ground floor, Jeevan Tara , No 5 , Parliament Street , New Delhi - 1100 01**” and reach the office on or before date fixed and notified in the tender document.
6. The Tenders will not be received after the due date and the time fixed. However, if the UTIITSL desires to extend the time limit, it will do so by informing on UTIITSL's website [www.utiitsl.com](http://www.utiitsl.com) either before the due date and time fixed for submission or after the due date and time.
7. In case the due date for submission / opening of the tender is declared as a public holiday in the State, (where the tender document is to be submitted), the time limit will be automatically changed to the next working day at the same time.
8. In case, the tenderer does not wish to quote for the work, the same should be informed to UTIITSL over letter / fax addressed to The Company Secretary on or before the due date of submission of the Tender. **The blank Tender also must be returned to the UTIITSL.** The technical specification, design and all other contents of the tender documents are patent and the same should not be reproduced without the prior permission of the UTIITSL. The payment made to UTIITSL towards the cost of the tender document is not refundable.
9. UTIITSL will take no responsibility for delay or loss or non-receipt of tenders after dispatch, by the tenderer.
10. The tenderers are advised to drop the tender in tender box kept in the office of UTIITSL as mentioned on cover page 1 or ensure that the tender reaches the office before the due date fixed for submission of the tender. This tender box would be opened and the tenders scheduled to be opened at 3.30 pm would be taken out from the tender box for consideration.

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11. **The tenderers are requested to inspect the site of work and acquaint about the site conditions and rules and regulations before quoting the rates. For this, the officials of UTIITSL may be contacted to make the arrangements.**
12. The rate quoted should be inclusive of the cost of materials, labour, transportation, Sales Tax, Excise Duty, Cess, Sales Tax on works contract, VAT but exclusive of Service tax along with Education Cess and Secondary and Higher Education Cess as applicable to this Works Contracts Service. The service tax along with Education Cess and Secondary and Higher Secondary Education Cess shall be reimbursed on production of proof of payment made to concerned authorities.
13. The tender should be submitted strictly as per the terms & conditions spelt out in the tender notice. The tenderer should not make any alteration in the terms & conditions, drawings, specifications etc. In case of any alteration the tender may be considered as invalid/void.
14. **Incomplete tenders are liable to be rejected.**

**B. Opening of the Tender:**

1. The sealed tenders will be opened in the presence of the authorized official of the UTIITSL/Client on the day as specified on the cover page.
2. Intending tenderers who wish to be present at the time of opening of tenders may be present at the office address as mentioned in page no. 3 point on Note. 2 on the day fixed for opening of the tender.

**C. Acceptance of the tender :**

1. The rates quoted by the contractors should be valid as specified in the cover page.
2. UTIITSL reserves the right to accept / reject summarily any / all tenders in whole or part thereof without assigning any reason whatsoever and also does not bind itself to accept the lowest or any other tender.
3. It will be open to UTIITSL to negotiate the terms including the rates quoted with the lowest tenderer. The negotiated price by UTIITSL will be the contract value and work order will be placed for the said amount.
4. The tenders for the work shall remain for acceptance for a period as specified on the cover page or the period that may be extended by mutual agreement and the tenderers shall not cancel / withdraw the tenders during that period.
5. Each tenderer must submit an Earnest Money Deposit of as mentioned on the cover page (page no.1) in the form of a **Demand Draft only** in favour of UTI Infrastructure Technology And Services Ltd.

Contractor's Signature

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payable at **New Delhi** drawn on any Nationalized bank or approve scheduled bank (and which shall not bear any interest). The tender document duly filed shall along with the tender duly marked with details. **No tender will be accepted with out EMD.** The EMD will not carry any interest. In case of failure on the part of the contractor for commencement of work / delay in execution of the project, the said amount will be forfeited.

6. The Earnest Money will be returned to the unsuccessful tenderer after the intimation of rejection of the tender is sent. The Earnest Money will be retained in the case of the successful tenderer and will get converted as a part of Security Deposit for the due performance of the contract.

**7. Earnest Money Deposit will be forfeited, if the contractor:**

- a. Revokes the tender or increases the earlier quoted rates within the validity period.
- b. Refuse, delay to sign and execute the contract after tender is accepted.
- c. Does not commence the work within the time specified in the letter of intent/work order or 7 days from the issue of such letter, whichever is later.

**8. The tenders will be rejected if;**

If the contractor does not quote any of the item/sub-item in the tender.

If the contractors make the correction in the rate while quoting and not countersigned duly stamped at that particular item of work.

If the contractor is not empanelled with UTIITSL and does not meet the eligibility criteria.

- If the contractor proposes any alterations to any of the conditions laid down or proposes any other conditions of any description whatsoever.

9. The tender which does not fulfil any of the prescribed conditions will not be accepted.
10. Canvassing in connection with the tender is strictly prohibited.
11. **In case the performance of the Contractor is observed to be not satisfactory his tender may not be consider.**

**D. Execution of Work :**

1. The work should commence *within the period specified on the cover page no.1* from the date of the receipt of work order or the date that may be indicated in the work order. Accordingly, date of commencement of the work will be reckoned from the day as specified in the cover page.
2. The *work should be completed as specified on the cover page calculated* from the date of commencement of the work or within the time limit that may be indicated in the work order.
3. Time allowed for execution of work, as specified in tender, shall be the essence of the contract.

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4. If the contractor commits default in commencing the work, as required by the work order and found that the date stipulated cannot be adhered to, UTIITSL shall be entitled without prejudice to any other rights or remedies available may terminate / rescind the contract.
5. If the contractor fails to carry out the work within the stipulated time mentioned in the work order, the UTIITSL will have liberty ***to impose penalty @ 2% of the total contract value per week*** of delay subject to an overall limit of 10%, without prejudice to other remedies available. The tenderer has to pay to UTIITSL such amount that may fall short over the amount due to them, if any.
6. However, if UTIITSL is convinced that the delay in execution of the work is beyond the circumstances created by the tenderer, they may award extension of the same to the extent they feel justified based on the request of the tenderer. In such case liquidated damages will be levied for the balance period, if any as provided as per the condition of the tender.
7. If the tenderer fails to commence the work within the days as specified on the cover page from the date of receipt of intimation for commencement of the work and / or the contractor fails to show progress in execution of work and UTIITSL feels the work cannot be completed within the stipulated time, UTIITSL will have the right to terminate the contract by **giving three days notice** to the contractor, at the full discretion of UTIITSL and the decision of UTIITSL will be final and binding. In case of termination of the contract, the payment if any, due to the contractor will be released only on completion of the entire project. The amount that may be spent for completion of the balance work will be recovered from the contractor. It will be the full discretion of UTIITSL to carry out the balance work through any agency at any rate as per the specification.
8. All the ***materials and workmanship*** shall be of the kind described in the schedule of quantities / specifications and in accordance with relevant BIS codes and as per directions of the Engineer-in-charge.
9. The contractor shall produce original vouchers/ challans etc., for verification of actual purchases of any material and submit photocopies of same, if so, desired by the Engineer-in-charge.
10. The contractor shall submit manufacturers' test certificates for all important materials and in case if so desired by UTIITSL will have to carry out testing of materials brought on site at their own cost in any institute / laboratory / site of works as desired by the Engineer-in-charge. No extra claim will be entertained for such testing of materials.

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11. The contractor shall not at any time do, cause or permit any nuisance on the site/ do anything which shall cause unnecessary disturbances or inconvenience to the occupants / visitors at site or near the site of work.
12. The quantities indicated in the bill of quantities are approximate and the quantities may vary as per the site conditions / requirements. The rate quoted should be firm for the total quantities of work executed to complete the work. The tenderer's workers will not be allowed to stay at the work site.
13. The contractor his workers can use the common facilities such as drinking water, toilet etc., provided at the premises. However, it should be ensured that the same should be kept in hygienic condition
14. Water and Electricity as per the availability at site can be made use of by the contractor. If not available the contractor has to arrange it on his own. The Actual consumption for water and electricity charges in case used from the site shall be paid by the Contractor.
15. In case of any damage to the existing structure, the contractor should rectify the same free of cost up to the satisfaction of the Engineer-in Charge.
16. UTIITSL will have the liberty to modify the design to a reasonable limit. No extra charges will be paid for execution after such modification.
17. The tenderer should protect the work till its completion and handing over against any possible damage, theft, scratches, etc.
18. The tenderer has to make arrangements for cleaning the work site every day and on completion of the work from the work area at his cost.
19. The tenderer should provide samples of the materials for approval of UTIITSL and the samples will be kept in the custody of the Engineer-in-charge.
20. Wherever possible the work has to be carried out at the factory of the contractor and the items to be transported to the site.
21. The contractor should allow Engineer-in-charge or any other designated officer to inspect the items being made at the factory / work place. The contractor should complete fabrication and other works at factory and only assembling work and the finishing may be carried out at the site.
22. The tenderer should abide by the rules and regulations for the premises especially on the working hours, entry to the workers to the premises, interpersonal relation with the staff members and other agencies engaged at the site.



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23. The tenderer should make necessary arrangement for covering of all the furniture items/ records, if any of the client with cover / cloth during the course of work.
24. **The tenderer should arrange a qualified technical supervisor at site during the course of the entire work.** The tenderer should not change the supervisor till completion of the work. The supervisor should be available at site when the work is in progress.
25. Any damage / loss to UTIITSL will be rectified at the cost & risk of the contractor.
26. The workmanship should be of high quality / standard and the decision of the Engineer-in-charge / Consultant shall be final in the regards.
27. The tenderer should not apply primer / putty work / paint or any other finishing material before inspection and certification of the wood work by the Engineer in Charge.
28. The tenderer should not engage any person prohibited by the law for execution of the job.
29. The tenderer should carry out the work strictly as per the specification and as directed by the Engineer-in- Charge.
30. All the materials proposed to be used should have the approval of UTIITSL.
31. The materials required for the work **should be purchased only from the manufactures directly or from the approved dealers.** Confirmation for the same may be submitted if so desired.
32. The tenderer should strictly follow the approved colour scheme. The colour scheme will be intimated to the contractor within a week from the date of issue of the work order. However UTIITSL has the liberty to make any other modifications as per requirements.
33. The dismantled material / debris/ waste material should be removed from the site daily and be transported out to the place as designated by the Municipal Corporation at his own cost.
34. The tenderer should make his own arrangement for storage of materials. UTIITSL may provide some space subject to availability (uncovered) within the premises for storage purpose. Materials only as per requirement are to be stored at site. Security for the material such stocked /lying at site will be arranged by the contractor.
35. It is the responsibility of the contractor to get the confirmation certificate from the client after virtual completion of the work.
36. All the electrification work shall be carried out by the licensed electrician under the supervision of licensed electrical contractor. After completion of the work, they shall submit the test certificate for the electrical work carried out by them.

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37. the contractor need to clean the premises on day to day basis.

In case the work is required to be carried out on holidays, Sundays, night hours, after office hours necessary permission shall be obtained from the client/ UTIITSL

**E. Payments :**

1. No advance will be paid.

1(a.) The billing is to be done in the name of the client as specified on cover page (page no.1) of the tender.

1(b) **The Contractor has to submit the bill strictly as per the format of the specifications as mentioned on the bill of quantities in the tender document.**

2. All the payments shall be released to the tenderer on back to back basis once the payment is received from the client.

3. The running account bills will be released for the completed items of work and for the partly completed items based on the percentage of the work executed on proper submission of the bill together with the measurements of the work carried out. The Security Deposit, other statutory deduction and any other amounts as may be deductible / recoverable as per the terms and conditions of contract will be deducted from the running bills.

4. The payment towards the settlement of running bills will be treated as the advance towards settlement of final bill.

5. 10% of the value of each running bill will be deducted as Retention Money / Security Deposit.

6. The final bill will be released on satisfactory completion of the entire work and on completion of all the terms and conditions / obligations spelt out and on proper submission of the bill together with the measurements.

7. 50% of the Security Deposit will be refunded together with the final bill. The remaining 50% will be returned to the tenderer after the completion of defect liability period of *12months*. **Before releasing the security deposit, it is mandatory that the contractor has to take the completion certificate from the respective Client.**

8. The contractor should approach the concerned client officials one month before the completion of the -Defect liability Period- and obtain such certificate so that the Security Deposit may be released. In the event that some rectification or some repairs have to be carried out, the same should be completed and got certified from the concern client and forwarded to us for releasing the Security Deposit.

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**9.Note: It is responsibility of the contractor to take the no objection certificate/ no defects certificate from the concerned official on completion of the defect liability period. UTIITSL/ Client would not be responsible for the certificate.**

**10.In case the no defect certificate/no objection certificate is not taken by the contractor, then the Security deposit will not be released till such time UTIITSL has a satisfactory note in successful completion of the defect liability period..**

11.Income Tax, Sales Tax on Work Contract, VAT, Cess and / or any other Statutory deductions as per the prevailing rules at the time of execution will be deducted from the payable amount for which certificate will be issued in favour of the tenderer.

12. Tenderer will not be entitled to any interest on Retention Money or any Running account bill money for the time it will remain with the UTIITSL/Client.

13. The items of works as well as the approximate quantities against these items as given in the schedule of *quantities and the same should not be considered precise quantity of works to be carried out.* The tenderer shall be paid on the basis of the actual quantity of completed work as per the provisions of the contract and as per the specifications.

#### **8. DEVIATION, VARIATION, EXTRA / DEVIATED ITEMS AND PRICING :**

The rates of such altered, additional or substituted works shall be determined in accordance with the following.

- a. The net rates or prices in the original tender shall determine the valuation of the extra work where such extra work is of similar character and executed under similar conditions as the work priced therein.
- b. If the rate for any altered, additional, or substituted item of work is not specified in the schedule of quantities, the rate for that item shall be derived from the rate for the nearest similar item specified therein.
- c. If the rate for altered, additional or substituted item of work cannot be determined in the manner specified above, then such items of work shall be priced on the basis of rates for labour and materials as per the market rate prevailing at the time of execution.
- d. While fixing rates of extra items 15% (Fifteen percent only) shall be allowed on the cost of material and labour to cover all supervision, overheads, statutory Taxes and Levies and profits except service tax.

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- e. Items for which the rates, as assessed by the UTIITSL are higher or lower by more than 35% of the market rates shall be termed as Abnormally High Rated Items (AHRI) and Abnormally Low Rated Items (ALRI) respectively. The deviation limit for variation in quantities of AHRI & ALRI shall be 25% in foundation and plinth, and 15% in super-structure. Quantities in excess of the deviation limit shall be treated as extra items of work and priced accordingly as above. The decision of the UTIITSL on categorization of items as AHRI / ALRI shall be final and binding.
- f. For all extra items of work, the contractor should submit to the concerned UTIITSL Engineer the necessary particulars along with his analysis and the rate he proposes to claim for consideration immediately or latest within a period of 4 (four) weeks from the time of cropping up of any authorized extra / deviated item. He shall also ensure that all the authorized claims are included in the final bill. If the contractor fails to submit his claim within the stipulated period or the period duly extended by the UTIITSL Engineer, then the UTIITSL shall proceed to fix the rate for the item(s) and the same shall be final and binding on the contractor.
- g. The Contractor shall note that Extra/Deviated items claim and/or any other claim whatsoever if submitted after submission of his Final Bill, will not be entertained and considered. The Contractor shall not be allowed to make any Additions/ Alterations/ Revisions / Changes/ Modifications/ Variations in the final bill, after the final bill is submitted by him.

15. The Tax invoice and the abstract of the bill should be submitted strictly as per the approved format of UTIITSL.

16. The bill should be attached with all necessary measurements, sketches, joint measurements (if any).

**F. Escalation :**

1. **No escalation** in rate shall be paid for the works carried out.
2. No claim on account of fluctuation of rates of material and labour will be entertained during the course of work (from the date of acceptance of the Tender till issue of completion certificate).

**G. Defect Liability Period :**

1. Defect Liability Period as per the terms of the contract is *12 months* from the date of virtual completion of the work. The work will be considered as virtually completed only when the tenderer completes the entire work as per the specification and joint inspection of work by the Engineer-in-charge and tenderer.

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2. The **Security Deposit** will be refunded only after the defect liability period of *12 months* and rectification of the defects occurred whether pointed out in inviting or not. It will be the duty of the contractor to inspect the site for defects and rectify the defects within the defect liability period.
3. During the course of Defect Liability Period the tenderer has to rectify all the defects, if any, noticed free of charge.
4. In case the tenderer fails to attend the rectification work within 7 days of reporting the same in writing, UTIITSL will have the liberty to carry out the said work through some other contractor at the cost & risk of the tenderer. Such expenditure incurred to the client will be recovered from the Security Deposit. In case any expenditure incurred is more than the Security Deposit, the tenderer should pay the difference that may fall short.
5. While carrying out the rectification work, the tenderer should ensure that the surroundings should be protected against any possible damage. In case of any damage, the same should be made good by the tenderer.

**H Statutory obligations to be followed :**

1. The tenderer should ensure adherence of all statutory requirements under the State and Central Rules in force and other local bodies for smooth and timely completion without any additional cost.
2. The tenderer shall comply with the provisions of all the rules and regulation in respect of labours engaged at site (such as Contract Labour {Regulation & Abolition} Act, 1970, Minimum Wages Act, Apprentice Act and all other labour laws as may be enforced from time to time by the Government Authorities) for execution of work, procurement of material for completion of the entire project. UTIITSL shall not be held responsible for any penalty on failure of any of the labour regulations or on failure of any compliance of any rule in force.
3. The tenderer shall strictly comply with the provision of Sales Tax (both State & Central), Excise Duty, etc. All the duties / taxes with respect to the work should be borne and paid by the tenderer himself. UTIITSL shall not be responsible for any payment/ penalty on this account at any stage.
4. The goods are manufactured at the tenderers office / site, the tenderer has to pay Central Excise and he has to produce Excise Invoice Copy for removal of goods from the manufacturing site. In case the goods are manufactured or produced at the site then Excise Invoice showing that the Central Excise has been paid should be submitted to UTIITSL.

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5. The tenderer should submit a statement confirming that all duties / taxes of every nature covered under the contract have been paid and the tenderer shall indemnify the UTIITSL against all claims in that behalf.
6. The tenderer should ensure adherence of all the requirements under the State and Central Rules in force.
7. The tenderers should submit an affidavit / Declaration on payment of Central Excise as per the enclosed format.
8. The tenderer should also submit when required, a copy of the declaration filed with the Central Excise for the last financial year.
9. The tenderers are required to take ***Contractor's All risk insurance policies (CAR Policies)*** with respect to the work and Workmen insurance policy for the workmen within 3 days from the receipt of the LOI with an approved Indian Insurance Company in the **joint name of the CLIENT and the Tenderer valid** from the date of commencement of work till the completion of the Works .The Contractor also submit the Workmen Compensation policy .
10. The value of the work to be insured would be 125% of the contract value.
11. The CAR policies should have additional coverage under 3<sup>rd</sup> party liabilities and maintenance period. The liabilities should be one lakh rupees per accident and the number of accidents. The maintenance period shall be the defect liability period as per the terms of the contract. The photocopies of the premium receipt and the policies should be submitted to UTIITSL.
12. The tenderer has also to insure their workers under Workman's compensation Act- 1923. The Contractor also submit the Fire Policy for the period of one year from the date of the Completion of the Work , Policy value of the Final bill Value.
13. UTIITSL will have the right to protect its interest either by taking insurance directly or by any action that it may deem fit on account of the tenderer and recover the same from the tenderer incase the tenderer fail to do so.
14. The tenderer has also to insure their workers under Workman's compensation Act- 1923.
15. UTIITSL will have the right to protect its interest either by taking insurance directly or by any action that may deem fit on account of the tenderer and recover the same from the tenderer incase the tenderer fail to do so.

#### **H. Responsibilities of the tenderer**

1. The tenderer should enter into an agreement as per the articles of agreement on stamp paper attached with this notice within 7 days of issue of acceptance of the tender.

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2. The tenderer shall not sublet the work without written approval from UTIITSL.
3. The tenderer should co-ordinate with all the other contractors for execution of the project.
4. The tenderer should set out the layout at site before commencement of work and obtain approval to the same from UTIITSL.
5. The contractor should arrange for sufficient light & power point required for entire project at his cost.
6. The tenderer should clear the site within 7 days of virtual completion of work of all material not paid for.
7. The tenderer should submit the Material Procurement schedule and bar chart of work along with the acceptance letter.
8. The tenderer should take adequate precaution against fire hazard at site. The tenderer should ensure that all fire safety measures are taken during execution and that the work carried out is as per the fire safety norms of the local Fire office.
9. The tenderer should arrange scaffoldings / ladders for proper execution of work, also to ensure safety of the workers as per the relevant provisions of the law.
10. The tenderer should submit samples of the material proposed to be used for the approval of UTIITSL.
12. The tenderer should prepare mock-up of the items for the approval of the UTIITSL and as per the advise of UTIITSL, the contractor has to modify the mock-up samples till it meets with the approval of the UTIITSL. The expenditure that may be incurred for making the mock-up samples should be included in the respective items of work.
13. In case the tenderer is a partnership firm, any change in the constitution of the firm shall take place only with the prior approval of UTIITSL during the contract period.
14. The tenderer should submit shop drawings for all the items for the approval of UTIITSL before execution of each item of work.
15. The tenderer should remove the rejected work / materials immediately on receipt of instruction to do so.
16. The tenderer has to ensure safety of the premises and the work till handing over of the same to UTIITSL.
17. The tenderer should submit the As-built drawings of the entire work together with the Final bill.
18. UTIITSL has been appointed as the Consultant for our client as mentioned elsewhere in the contract no arbitration or legal claim will stand against UTIITSL. The claim if any with

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respect to the work payment or any other matter including release of Security Deposit etc., will be limited to the client as mentioned and not against UTIITSL.

**19. The Contractor should strictly follow up the rule of the building Societies for executing the job times schedules etc.**

**20. The contractor should obtain necessary permission from the building society executing the said work along with the security deposit amount if any which is on refundable basis.**

**21. Determination of contract due to abandonment or reduction in scope of work:**

If at any time after the acceptance of the tender, the UTIITSL/CLIENT shall for any reasons whatsoever not require the whole or any part of the works to be carried out, the UTIITSL shall give notice in writing to the Contractor who shall have no claim to any payment of compensation or otherwise whatsoever on account of any profit or advantage which he might have derived from the Execution of the whole of the works.

The Contractor shall be paid at contract rates for the full amount of work executed and All surplus materials collected for incorporation in the work, which the Contractor has procured will be taken back by the contractor.

#### **SERVICE TAX**

- **22. Service Tax along with Education Cess and Secondary and Higher Education Cess as applicable to Works Contract Service in terms of Section 66B and Section 67 of Finance Act, 1994 read with Rule 2A of Service Tax (Determination of Value) Rules, 2006 shall be chargeable on the contract. The quantum of service tax chargeable by service provider shall be determined in terms of Section 68(2) of Finance Act, 1994 read with Rule 2(1)(d)(i)(F)© of Service Tax rules, 1004 and Notification No. 30/2012-ST dated 20<sup>th</sup> June, 2012 (as amended). Service Tax Registration Certificate of service provider to be enclosed along with tender application.**
- **The quantum of service tax as admissible will be payable on receipt of a demand raised by the service provider on actual service tax paid basis.**
- **The special conditions annexed with this notice has to be strictly followed.**
- **This notice shall form part of the contract.**



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## UTI Infrastructure Technology And Services Ltd.

Summary		
1.	Time of Completion	<b>45 days</b> from the date of commencement of work
2.	Date of Commencement of work	Within 7 days of LOI or actual date of commencement which ever is earlier.
3.	Liquidated damages	2 % of the total contract value per week subject to the maximum of 10 % of the contract value
4.	Validity of the offer	60 days from the date of opening the tender.
5.	Security Deposit (Retention money)	10 % of total value of work done, out of which 50% will be released at the time of settlement of final bill.
6.	Sales Tax, Excise duty, Royalty, Octroi, Work contract tax or any other statutory levies / Taxes / Cess.	<b>To be entirely borne by the Contractor. The Sales Tax, Excise Duty, Octroi, Works Contract Tax and any other statutory levies / taxes / cess as applicable. Service Tax shall be reimbursed on production of receipt as proof of payment.</b>
7.	Insurance policy Within 3 days of LOI	<ol style="list-style-type: none"> <li>CAR policy with value of 125% of the contract value in the joint name of client and the tenderer up to the completion of the works.</li> <li>Third Party Insurance – Rs.1 Lac per accident.</li> <li>Workmen Compensation policy</li> <li>Fire Policy for the Period of one Year from the Completion of the work for the value of the Final bill Value.</li> </ol>
8.	Defects Liability Period	12 (Twelve) months from the date of virtual completion / handing over of site to the client
9.	Terms of Payment	<ol style="list-style-type: none"> <li>No advance</li> <li>All the payments (running bills and final bill) shall be released to the tenderer by the Bank.</li> </ol>

Contractor's Signature

Seal

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		3. Final Bill settlement within 45 days from the date of proper submission and verification of measurements and handing over of site to client whichever is later
10.	Deductions	<p>Income Tax at source as per Income Tax Rules and as per Income Tax directives.</p> <p>Sales Tax / Works Contract Tax/ Commercial Tax as applicable in the state.</p> <p>Cess applicable as per the local rules Any other Levy/Cess/Tax to be deducted at source by law.</p>
11.	Extra / Additional work	15% of the cost of material and labour towards overheads and profit

**I/ We hereby agree and accept the above terms and conditions.**

(Seal)

For (Name and address of the Contractor)

Signature of the Tenderer

For (Name of the Contractor and Designation)

Contractor's Signature

Seal

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### Annexure-I

**(On Rs.100/- non-judicial stamp paper by the successful bidder)**

From. : **Contractor**

To : UTI Infrastructure Technology And Services Limited,  
UTIITSL Tower, Plot No. 3, Sector 11, CBD Belapur, Navi Mumbai 6 400 614

Dear Sirs,

We refer to the tender dated \_\_\_\_\_ for \_\_\_\_\_, hereby confirm that we have complied with all formalities in the performance of our Contract for the supply of goods and services under all statutes governing the same, Central, State or Local. We further confirm that we have paid all taxes and duties including sales tax and excise duty in respect of the goods and services supplied to you and undertake to be responsible for the same.

We agree to indemnify and keep you indemnified against any claim or demand and all loss, costs, charges and expenses incurred or suffered by you as a result of any claim being made by any person in respect of our obligation under the said tender for payment of taxes, duties or otherwise.

Yours truly,

**Date:**

**SIGNATURE OF CONTRACTOR  
WITH RUBBER STAMP**

Contractor's Signature

Seal

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**Annexure - II**  
**(On Rs.100/- non-judicial stamp paper by the successful bidder)**

From : **Contractor**

To : UTI Infrastructure Technology And Services Limited,  
UTIITSL Tower, Plot No. 3, Sector 11, CBD Belapur, Navi Mumbai 400 614

Dear Sirs,

We refer to the tender dated \_\_\_\_\_ for \_\_\_\_\_. We advise that, we are covered under the exemption limit prescribed by the Central Excise Act 1944 and no Excise is payable by us on the goods and services supplied to you. We further confirm that we have complied with all the formalities in the performance of our contract for the supply of goods and services and under all statutes governing the same, Central, State or Local.

We undertake that if any taxes and duties including sales tax and Excise duty in respect of goods and services supplied to you by us is payable, the responsibility of paying the same shall be ours.

**We agree to indemnify and keep you Indemnified against any claim or demand and all loss, cost, charges and expenses incurred and suffered by you as a result of any claim being made by any person in respect of our obligation under the said tender for payment of taxes, duties or otherwise.**

Yours truly,

Date:

**SIGNATURE OF TENDERER  
WITH RUBBER STAMP**

Contractor's Signature

Seal

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**ARTICLES OF AGREEMENT**  
**(On Rs.100/- non-judicial stamp paper by the successful bidder)**

ARTICLES OF AGREEMENT made at Mumbai this \_\_\_\_\_ between \_\_\_\_\_ UTI Infrastructure Technology And Services Limited, having its Registered Office at UTI ITSL Tower, Plot No. 3, Sector 11, CBD Belapur, Navi Mumbai - 400 614 (hereinafter called the "Consultant" of the one part) and \_\_\_\_\_, (hereinafter called the "Contractor" of the other part).

WHEREAS the consultant on behalf of client \_\_\_\_\_ is desirous of carrying \_\_\_\_\_, hereinafter called "The Work" and has prepared drawings/specifications the Schedule of Quantities, which have been seen and understood by the contractor..

AND WHEREAS the contractor has agreed to execute upon and subject to the conditions and instructions set forth herein (hereinafter referred to as the "the said conditions") the works shown upon the said drawings and/or described in the said specifications and included in the said Abstract Schedule of Quantities at the item rates therein set forth amounting to the contract sum of **Rs. \_\_\_\_\_ only**) hereinafter referred to as "the said contract amount"

**NOW IT IS HEREBY AGREED AS FOLLOWS:**

1. In consideration of the said Contract amount to be paid at the times and in the manner set forth in the said conditions, the Contractor shall upon and subject to the said conditions execute and complete the works shown upon the said Drawings or described in the Specifications and/or the priced Schedule of Quantities.
2. \_\_\_\_\_, the Client shall pay the Contractor the said contract amount or such other sum as shall become payable at the times and in the manner hereinafter specified in the said conditions either directly or through the consultants.
3. The said conditions and appendices thereto shall be read and construed as forming part of this Agreement, and the parties hereto shall respectively abide by and submit themselves to the conditions and perform the agreement on their part respectively in such conditions contained.
4. The contractor shall complete the work within the time period stipulated in the work order. Time is the essence of contract.
5. Work completion certificate to be taken by contractor from the client.

Contractor's Signature

Seal

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6. All disputes arising out of or in any way connected with this Agreement shall be deemed to have arisen in Mumbai and only the Courts in Mumbai, shall have jurisdiction to determine the same.
7. This Contract comprises :
- Tender documents serial pages \_\_\_\_\_ to \_\_\_\_\_ dated \_\_\_\_\_.
  - Subsequent correspondence and written instructions from time to time on the work
  - Work order no. \_\_\_\_\_ dated \_\_\_\_\_
  - Specifications and Drawings
8. Only NIL alterations have been made in these documents and as evidence that these alterations were made before the execution of Contract Agreement, they have been initialed by the Contractor and The Company Secretary / official otherwise designated by UTI Infrastructure Technology And Services Limited, the said officer is hereby authorised to sign and initial the documents on behalf of the **UTI Infrastructure Technology And Services Limited**, the document forming part of this contract.
9. IN WITNESS WHEREOF THE official seal of the UTI Infrastructure Technology And Services Limited, was thereto affixed on its behalf by the Company Secretary / official otherwise designated by UTI Infrastructure Technology And Services Limited and the Contractor/s has / have signed this Agreement on the dates respectively mentioned against their signatures in the presence of the following witnesses.

Signed by the Contractor

Signature with: \_\_\_\_\_

Rubber Stamp

Date : \_\_\_\_\_

In the presence of :

Signature : \_\_\_\_\_

Name : \_\_\_\_\_

Address : \_\_\_\_\_

Date : \_\_\_\_\_

For and on behalf of

UTI Infrastructure Technology And Services Ltd.

Signed by í í í í í í í í í í í í í í .

Name :

Address : \_\_\_\_\_

Date : \_\_\_\_\_

In the Presence of

Signature : \_\_\_\_\_

Name : \_\_\_\_\_

Address : \_\_\_\_\_

Date : \_\_\_\_\_

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## UTI Infrastructure Technology And Services Ltd.

### **Special conditions of the contract**

- 1. The wood to be used should have similar / uniform color, grains and should be totally free from white portions, decay, knots etc.**
- 2. All the edges of the plywood should be teak wood beadings. The beading to be fixed with adhesive / screw/ nails.**
- 3. The measurements indicated in the drawings are approximate and may vary as per the site conditions. UTIITSL's interpretation of the design and the specifications mentioned in the entire document shall be final and without appeal. In case of Errors or inconsistency, if any discovered in the drawing and specifications, UTIITSL's interpretation shall be final and without appeal.**
- 4. The contractor shall submit the Material Procurement Schedule & Bar Chart along with the acceptance of LOI and the progress chart during the course of work.**
- 5. For the design and other details mentioned in the entire document UTIITSL alone has the patent right.**
- 6. The contractor shall take the prior approval from UTIITSL for subletting the job even if the same is to a specialised agency.**
- 7. In case UTIITSL rejects a particular work the tenderer shall remove the same within two days and no payment shall be made for such work.**

Contractor's Signature

Seal

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8. The Contractor has to take all safety measures with regard to the workmen employed as per relevant laws and good engineering practices at site and safety measures against the fire hazard.
9. The contractor has to make necessary arrangement for internal lighting at the site.
10. The contractor has to carry out the job strictly as per specification spelt out in the bill of quantities, the drawings, instructions that may be issued by the Engineer-in-charge and the specification of the Bureau of Indian Standards, National Building Code etc.
11. In case of any discrepancy between the specifications and the drawings, the details mentioned in the specifications / Bill of quantities may be taken as final.
12. The electrical installation works to be carried out by engaging licensed electrical contractor. The successful tenderer shall submit the photocopy of Electrical Contractor's license at the time of execution of work. The copy of license of Electrical Supervisor and electricians also are to be submitted.
13. The work shall be carried out on holidays and Sundays, after and before office hours with the due permission of the UTITSL/ Client and during office hours on working days. There shall not be any problem, disturbance in office/ other areas/ floors as the work is to be executed in working office.
- 14. The tenderer is strictly advised to adhere to all the safety norms and precautions as stipulated in the BIS / NBC standards. The tenderer should follow all the relevant direction on safety and the directions related to safety as given in the tender. Please note that no work is to be carried out without following safety norms. Any instructions from any one against these norms are not to be followed and reported to the client / UTI ITSL in writing. UTI ITSL office will not be responsible for any work or any consequences or any damages arising out of action taken by the contractor which is in violation of this clause.**

The tenderer has to maintain a book for instructions from the Engineer-in-charge.

The work need to be carried out strictly as per the society rules and regulation.

Contractor's Signature

Seal



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The contractor needs to take necessary permission from society including the security deposit on refundable basis if required

Additionally,

- The L2 will be asked to confirm if he can do the work at the lowest rates quoted by L1.
- If the L2 gives a letter confirming that he is ready to carry out the work at the lowest rate (L1), then it can be considered to award the work to him also. The condition of this award of work to L2 on the rates of L1 will be as under:
  1. When L1 denies in writing that he does not have capacity to do the work.
  2. When it is observed by UTI Infrastructure Technology And Services Ltd. that L1 has not completed sites in time.
  3. When defects are found in the work of L1.
  4. When L1 does not take up the work as assigned with the stipulated time period as mentioned in the work order.

15 The contractors who have been restrained to bid due to bad or faulty workmanship or due to delay in carrying out the projects at scheduled time / period after bidding as per our letters reference and date as under :

- a. UTIITSL/ 590 /Empanelment/2014-15 dated 15-04-2014
- b. UTIITSL/ 593 /Empanelment/2014-15 dated 15-04-2014
- c. UTIITSL/ 595 /Empanelment/2014-15 dated 15-04-2014
- d. UTIITSL/ 2638 /Empanelment/2014-15 dated 09-06-2014
- e. UTIITSL/ 2639 /Empanelment/2014-15 dated 09-06-2014

shall not be entitled to bid. Even if such agencies download tender for and participate, their bids will be considered invalid.

16 .The Contractor if required shall make all necessary application and arrangements for his work to be inspected by the Local Authorities. The Contractor, if required, shall be solely responsible for obtaining the Municipal and other Authorities approval of his works prior to the handing over of the complete water supply / plumbing /sanitary installation to the UTIITSL/Clients within the quoted rates.

Contractor's Signature

Seal

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## UTI Infrastructure Technology And Services Ltd.

### PREAMBLE TO THE BILL OF QUANTITIES

The work is proposed to be carried out at the Office premises of H.O building of Punjab& Sind Bank, at 21, Rajendra Place New Delhi. The existing soil, waste and water supply pipes i.e plumbing system is proposed to be replaced wherever required and rectified. The quality of work proposed should have *the best* workmanship. The contractor should ensure that only the first quality materials mentioned in the list of material is purchased for the project.

1. The work should be carried out in such a way that the structure is not disturbed.
2. Any difference / discrepancies in the specification should be clarified with the Engineer in charge before submitting the tender. The Engineer in charge will have the liberty to modify the specification to a reasonable limit to suit the basic concept during the course of work; the tenderer should carry out such work with out any extra cost.
3. In case of any major modification such items will be considered as an extra item. Payment for such items will be paid based on the Engineering rate / Market rate analysis. **15% of the total cost of material and labour** will be considered as **tenderers profit**.
4. The contractor should co-ordinate with the other contractors employed at the site for smooth flow of work.

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### **LIST OF MATERIALS OF APPROVED BRAND AND/OR MANUFACTURE – PLUMBING WORK**

•	Cement	Larsen & Tubro / ACC / Birla / JK - 53 grade or high.
•	Cement for plastering work	Larsen & Tubro / ACC / JK- 43 grades.
1.	White cement	Birla white/JK
2.	Steel for reinforcement	Fe 415 / Fe 500 of TATA/SAIL/RATHI
3.	Water proofing compounds	DR FIXIT / FOSROC/ Sica / Krishna Chemicals
4.	Sanitary fittings	Hindustan Sanitary ware / Perry ware.
5.	Water supply fixtures	Jaguar & Co.
6.	CI Pipe & fittings ó LA Class	Bangal iron Corporation/ NICO
7.	GI Pipe ó C Class	TATA / JINDAL
8.	GI Fittings	R,KS,HB,UI
9.	Stoneware pipe ó Grade A	Dalmia
10.	Cement pipe	Everest
11.	PVC Pipe & fittings	SUPREME / Prince/ Tribore
12.	Gate valve	Leader
13.	Pipe fittings	R Brand
14.	Ball Valve	Leader
15.	CI Man hole	Kirloskar/ IVC / DN Singha
16.	Non Return Valve	Leader
17.	Toilet Seat cover	Commander / Patel
18.	Toilet ó Accessories	Jaguar & Co.
19.	Paint	Nerolac/ Asian/ Berger / ICI
20.	Anchor Fastner and Chemical	Fischer/Hilti
21.	Over Head Ware Tank	Syntax Tank

**NOTE:-**

- *Wherever more than one make are indicated, the contractor should use the material indicated first. UTIITSL will permit to use the material indicated 2<sup>nd</sup> and hereafter only if the material indicated 1<sup>st</sup> is not available and / or the same is not suitable (colour, size, shape, texture) as per the site condition.*
- *In case the tenderer wish to verify the detailed specification of materials, workmanship etc. the same may be verified from the office of UTIITSL before submission of the tender.*

*Whether a product is equivalent or not, will be decided by the Engineer-in-Charge only.*

## **UTI Infrastructure Technology And Services Ltd.**

Contractor's Signature

Seal

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## **SPECIFICATIONS**

### **General**

#### **A:**            **MATERIALS**

Materials shall be of the best-approved quality obtainable / available and they shall comply to the respective Bureau of Indian Standard Specifications.

Samples of all materials shall be got approved before placing order and the approved sample shall be deposited with UTIITSL.

In case of non-availability of materials in metric sizes, the nearest higher size in FPS units shall be provided with the prior approval of UTIITSL for which neither extra will be paid nor any rebate shall be recovered.

If directed, materials shall be tested in any approved Testing Laboratory and the Test certificate in original shall be submitted to UTIITSL and the entire charges of testing including charges for repeated tests if ordered shall be borne by the Tenderer.

It shall be obligatory for the tenderer to furnish Certificate, if demanded by UTIITSL from the manufacturer or the material supplier that, the work has been carried out using their material and as per their recommendation.

All materials supplied by or through UTIITSL OR other specialized firms if any, shall be properly stored and the tenderer shall be responsible for its safe custody until they are required on the works/until the completion of work.

Unless otherwise shown on the drawings or mentioned in the Schedule of Quantities or Specification the quality of materials, workmanship, dimensions etc., shall be as specified here-in-under.

All equipment and facilities for carrying out field tests on materials shall be provided by the tenderer without any extra cost.

Contractor's Signature

Seal

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## **WATER SUPPLY SYSTEM**

### **SCOPE OF WORK**

The work under this section consists of Plumbing and Sanitation worked out with Skilled Plumbers, BIS approved materials ,equipment and appliances required to completely install the water supply system as required by the Client/UTIITSL, as specified hereinafter and given in the Schedule of Quantities and Drawing

The water supply system shall includes the following :-

- \*Water supply works inside the building including connection to vertical stack / main line.
- \*Running of pipe line with necessary clamps along with wall brackets
- \*Connections to the existing Internal water supply lines
- \*Connection to the Internal wastewater line
- \*Connection to the Internal soil pipe line
- \*Rectification of water tank including grouting, Applying of waterproof coat and protection plaster
- \*Providing of Puddle flange in RCC Tank wall.
- \*Providing of necessary Ball valve/butterfly valve/Non Return valve.
- \*Providing of rungs inside the RCC Water Tank
- \*Providing of CI Man hole for water tank
- \*Construction of Inspection Chambers with required U/V notched 1:2:4 Mix concrete bed finished with water proofing ,cement slurry with proper slope (1in 63) including providing of CI Manhole .

### **GENERAL REQUIREMENTS:**

All materials shall be NEW and of the best quality conforming to relavent BIS Code specifications. All works executed shall be to the satisfaction of the UTIITSL/CLIENT.

Pipes and fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workmanship manner.

Short/ long bends shall be used on all full length of pipe lines wherever required. No of elbows shall be minimised for the short connections to maintain the rate of Flow.

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Pipes shall be laid in a manner to provide a possible easy accessibility for repair and maintenance and shall not cause obstruction in shafts/ passage etc.

Valves and other appurtenances shall be so located as to provide easy accessibility for operations, maintenance and repairs.

Pipe shall be securely fixed to wall and ceiling by suitable clamps at intervals specified.

## **MATERIAL SPECIFICATIONS**

### **B) – Plumbing, Water Supply and Drainages**

#### **1. WORKMANSHIP**

The workmanship shall be best of its kind and shall conform to the specifications, as below or Indian Standard Specifications in every respect or latest trade practices and shall be subject to approval of the UTIITSL/Clients. All materials and/or Workmanship which in the opinion of the UTIITSL/Clients is defective or unsuitable shall be removed immediately from the site and shall be substituted with proper materials and/or workmanship forthwith.

#### **2. 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 origins approved by the UTIITSL/Clients.

As and when required by the UTIITSL/Clients, the contractor shall arrange to test the materials and portions of works at his own cost to prove their soundness and efficiency. If after tests any materials, work or portions or work are found defective or unsound by the UTIITSL/Clients, the contractor shall remove the defective material from the site, pull down and re-execute the works at his own cost to the satisfaction of the UTIITSL/Clients. To prove that the materials used are as specified the contractor shall furnish the UTIITSL/Clients with original vouchers on demand.

### **SECTION-01: WATER SUPPLY**

#### **1. SCOPE**

The scope of this section comprises the supply, installation, testing and commissioning of Piping network for water supply for internal & external services as follows:

- a. Bore well / Municipal / Tanker Water supply.
- b. Drinking Water Supply.
- c. Flushing Water Supply
- d. Washing Water supply
- e. External water supply to cater for Horticulture and from the Treated Sewage Water Tank through an independent pumping System (as required).

Contractor's Signature

Seal

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f. Connection to various mechanical equipments to be supplied and installed by the other specialist contractors.

The Contractor shall make all necessary application and arrangements for his work to be inspected by the Local Authorities as required . The Contractor, if required, shall be solely responsible for obtaining the Authorities approval of his works prior to the handing over of the complete water supply / distribution installation to the UTITSL/Clients.

## 2. PIPING MATERIALS

The piping system shall consist of copper pipes confirming to BS 2871, class 1, table X, half hard for domestic plumbing and fittings shall confirm to BS 864 Part-II The piping system shall also consist of CPVC SDR 11.0 piping from 15 mm to 50 mm & Schedule 40 from 65 mm to 150 mm for cold water supply & schedule 80 from 65 mm to 150mm for hot water supply. The piping system shall also consist of heavy class galvanized iron pipes and fittings conforming to IS: 1239. The sizes and makes is specified in the Schedule of Quantities. For any internal works, the CPVC pipes / copper pipes / galvanized iron pipes and fittings shall be embedded in the wall chase or run on the floor/ceiling unless otherwise specified. No unsightly exposed runs shall be permitted.

### A Copper Pipes & Fittings

The pipes shall be hard tempered copper pipes and tubes confirming to requirements of EN 1057; BS 2871 Table 'X' Part -I-1971 and the fittings shall confirm to EN 1252 Part 1 / 2 / 5 & BS 864 Part 2. The flux shall be NSF 6 or equivalent.

The fittings shall be as follows:

- Internal Solder Ring (ISR) fitting : For pipes from 15 mm to 35 mm dia.
- Endex Fittings : For pipes from 42 mm to 54 mm dia.
- Endbrazed Fittings : For pipes from 67 mm dia and above.

Fabricated fittings in NO case shall be allowed. Fittings of all types such as Tees, Crosses, Elbows, Reducers, Unions, Off Sets etc. shall be used on the pipes. Suitable fittings of approved type and make shall be used for jointing copper pipes to GI pipes and for jointing copper pipes to CP fittings etc. shall be used. Use of DZR fitting shall be made for all connections.

### Laying and Jointing of Copper Pipes and Capillary Fittings

The copper pipes and fittings shall run in wall chase or ceiling or as specified. The fixing shall be done by means of standard pattern holder bat clamps keeping the pipes about 1.5 cm clear of the wall where to be laid on surface. Where it is specified to conceal the pipes, chasing may be adopted. For pipes fixed in the shafts, ducts, etc. there should be sufficient space to work on the pipes with the usual tools. As far as possible, pipes may be buried for short distances provided adequate protection is given against damage and where so required special care to be taken at joints. Where directed by the Owner's Site Representative / Architect, pipe sleeves shall be fixed at a place the pipe is passing through a wall or floor for reception of the pipe and allow freedom for expansion and contraction and other movements. In case of pipe is embedded in walls or floors it shall be covered with a protective tape wrapped around the pipes and fittings. Copper pipes shall be jointed with approved above mentioned fitting conforming to BS 864 Part

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2. Care shall be taken to remove any burr from the end of the pipes after cutting. Only fittings of the size suitable to the pipe shall be used. The ends of the tube shall be cut to the correct size using a tube cutter or a fine blade hacksaw. Care shall be taken to ensure that the ends of the tube are cut perpendicular to the axis of the tube and that the ends remain undamaged and free of burrs. Any burrs remaining shall be removed with a smooth file. Clean the outside surface of the tube that shall go into the fitting. Flux shall be applied on the pipe surface ensuring even and uniform application. Insert the tube into the fittings and push home until the stop is reached. Wipe off excess flux with a soft cloth. Now the assembled joint shall be heated with a blow torch or any similar appliance that emits a clean, blue, soot free flame. The heat shall be turned off once a complete ring of solder has appeared around the mouth of the fitting. The joint shall be allowed to cool without disturbance. All copper pipes to G.I. pipe and connection with the valves and faucets shall be with Dezincified Resistance fittings (DZR).

## **B. CPVC Pipes & Fittings**

The pipes shall be CPVC (Chlorinated Poly Vinyl Chloride) material for hot & cold water supply piping system with pipes as per CTs SDR -11 at a working pressure of 320 PSI at 23 deg C and 80 PSI at 82 deg. C, using solvent welded CPVC fittings i.e. Tees, Elbows, Couples, Unions, Reducers, Brushing etc. including transition fittings (connection between CPVC & Metal pipes / GI) i.e. Brass adapters (both Male & Female threaded and all conforming to ASTM D-2846 with only CPVC solvent cement conforming to ASTM F-493, with clamps / structural metal supports as required /directed at site including cutting chases & fitting the same with cement concrete / cement mortar as required, including painting of the exposed pipes with one coat of desired shade of enamel paint. All termination points for installation of faucets shall have brass termination fittings. Installation shall be to the satisfaction of manufacturer & Project Manager. Pipes from 65 mm to 150 mm dia shall be Schedule 40 for CWC & Schedule 80 for HWS / HWR.

### **i. Joining Pipes & Fittings**

#### **a. Cutting:**

Pipes shall be cut either with a wheel type plastic pipe cutting or hacksaw Blade and care shall be taken to make a square cut which provides optimal bonding area within a joint.

#### **b. Deburring / Beveling:**

Burrs and fittings should be removed from the outside and inside of pipe with a pocket knife or file otherwise burrs and fittings may prevent proper contact between pipe and fittings during assembly.

#### **c. Fitting preparation:**

A clean dry rag/cloth should be used to wipe dirt and moisture from the fitting Sockets and tubing end. The tubing should make contact with the socket wall 1/3 or 2/3 of the way into the fitting socket.

#### **d. Solvent Cement Application:**

Only CPVC solvent cement confirming to ASTM-F493 should be used for joining pipe with fittings. An even coat of solvent cement should be applied on the pipe end and a thin coat inside the fitting socket, otherwise too much of cement solvent can cause clogged water ways.

#### **e. Assembly:**

After applying the solvent cement on both pipe and fitting socket, pipe should be inserted into the fitting socket within 30 seconds, and rotating the pipe ¼ to ½ turn while inserting so as to ensure even distribution of solvent cement with the joint. The assembled system should be held for 10 seconds



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(approximately) in order to allow the joint to set up. An even bead of cement should be evident around the joint and if this bead is not continuous remake the joint to avoid potential leaks.

Set & Cure times:

Solvent cement set and cure times shall be strictly adhered to as per the below mentioned table. Minimum Core prior to pressure testing at 150 PSI

#### **Ambient Temperature during Pipe Size Core period ½ " - 1" 1¼" - 2"**

Above 15 deg. C 1 Hr 2 Hrs

4-15 deg.C 2 Hrs 4 Hrs

Below 4 deg C 4 Hrs 8 Hrs

Special care shall be exercised when assembling flow guard systems in extremely low temperature (below 4°C) or extremely high temperature (above 45°C) In extremely hot temperatures, make sure that both surfaces to be joined are till wet with cement solvent when putting them together.

f. Testing

Once an installation is completed and cored as per above mentioned recommendations, the system should be hydrostatically pressure tested at 150 psi(10 Bar) for one hour. During pressure testing, the system should be fitted with water and if a leak is found, the joint should be cut out and replacing the same with new one by using couplers.

#### **ii. Transition of Flow guard CPVC to Metals**

When making a transition connection to metal threads, special Brass / plastic transition fitting (Male and female adapters) should be used. Plastic threaded connections should not be over torqued Hard tight puts one half turn should be adequate.

#### **iii. Threaded Sealants**

Teflon tape shall be used to make threaded connections leak proof.

#### **iv. Solvent Cement**

Only CPVC solvent cement conforming to ASTM F 493 should be used for joining pipe with fittings and valves. Flow guard CPVC cement solvents have a minimum shelf life of 1 year. Aged cement solvent will often change colour or being to thicken and become gelatinous or jelly like and when this happens, the cement should not be used. The cement solvent should be used within 30 days after opening the company's seal and tightly close the seal after using in order to avoid its freezing. The freezed cement solvent should be discarded immediately and fresh one should be used. The CPVC solvent cement usage should be adhered to as given in table below Diameter of pipe in inch (flow guard) ½" ¾" 1" 1¼" 1½" 2" Approx. nos. of joints which can be made per litre of solvent cement.

200 Nos, 180 Nos, 150 Nos, 130 Nos, 100 Nos, 70Nos

#### **v. Hangers and supports**

For Horizontal runs, support should be given at 3 foot ( 90 cm) intervals for diameters of one inch and below and at 4 foot (1.2m) intervals for larger sizes. Hangers should not have rough or sharp edges which come in contact with the tubing. Supports should be as per the below mentioned table:

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### Size of Pipe 21°C 49°C 71°C 82°C

#### Inch Ft. Ft. Ft. Ft.

½ 5.5 4.5 3.0 2.5  
 ¾ 5.5 5.0 3.0 2.5  
 1 6.0 5.5 3.5 3.0  
 1¼ 6.5 6.0 3.5 3.5  
 1½ 7.0 6.0 3.5 3.5  
 2 7.0 6.5 4.0 3.5

### SCHEDULE – 40

Recommended Support spacing (in feet) **Nom. Pipe Size Temperature oC (In) (mm) 23 38 49 60 71 82**

2 ½ 65 7 ½ 7 7 6 ½ 6 3 ½  
 3 80 8 7 7 7 6 3 ½  
 4 100 8 ½ 7 ½ 7 ½ 7 6 ½ 4  
 6 150 9 ½ 8 8 7 ½ 7 4 ½  
 8 200 9 ½ 8 8 7 ½ 7 5

### SCHEDULE – 80

Recommended Support spacing (in feet) **Nom. Pipe Size Temperature oC (In) (mm) 23 38 49 60 71 82**

2 ½ 65 8 7 ½ 7 ½ 6 ½ 4 ½ 4  
 3 80 8 8 7 ½ 7 4 ½ 4  
 4 100 9 9 8 ½ 7 ½ 5 4 ½  
 6 150 10 9 ½ 9 8 5 ½ 5

### Galvanised Iron Pipes & Fittings

The pipes shall be galvanised mild steel welded (ERW) or (HFW) screwed and socketed conforming to the requirements of IS:1239. The Galvanising shall conform to IS:4736, the zinc coating shall be uniform, adherent reasonably smooth and free from such imperfections as flux, ash and drop inclusions, bare patches, black spots, pimples, lumpiness, runs, rust strains, bulky white deposits and blisters. The pipes and sockets shall be cleanly finished, well galvanised in and out and free from cracks, surface flaws laminations and other defects. All screw threads shall be clean and well cut. The ends shall be cut cleanly, and square with the axis of the pipe.

The fittings shall be malleable iron and comply with all the requirements of the pipes. The sizes of pipes and fitting is specified in the schedule of quantities.

### Laying And Jointing Of GI Pipes

The galvanised pipes and fittings shall run in wall chase or ceiling or as specified. The fixing shall be done by means of standard pattern holder bat clamps keeping the pipes about 1.5 cm clear of the wall where to be laid on surface. Where it is specified to conceal the pipes, chasing may be adopted for pipes fixed in the shafts, ducts etc. there should be sufficient space to work on the pipes with the usual tools. As far as possible, pipes may be buried for short distances provided adequate protection is given against damage and where so required special care to be taken at joints. Where directed by the UTITSL/Clients,

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pipe sleeves shall be fixed at a place the pipe is passing through a wall or floor for reception of the pipe and allow freedom for expansion and contraction and other movements. In case of pipe is embedded in walls or floors it shall be painted with anticorrosive bitumastic paints of approved quality. Under the floors the pipes shall be laid in layer of sand filling. Galvanised iron pipes shall be jointed with threaded and socket joints, using threaded fittings. Care shall be taken to remove any burr from the end of the pipes after threading. Teflon tape, White lead or an equivalent jointing compound of proprietary make shall be used, according to the manufacturer's instructions, with a grommet of a few strands of fine yarn while tightening. Compounds containing red lead shall not be used because of the danger of contamination of water. Any threads exposed after jointing shall be painted with bituminous paint to prevent corrosion.

## **1. PIPING INSTALLATION SUPPORT (VALID FOR GI / COPPER PIPING ONLY)**

Tender drawings indicate schematically the size and location of pipes. The Contractor, on the award of the work, shall prepare detailed working drawings, showing the cross-sections, longitudinal sections, details of fittings, locations of isolating and control valves, drain and air valves, and all pipe supports. He must keep in view the specific openings in buildings and other structure through which pipes are designed to pass.

Piping shall be properly supported on, or suspended from, on stands, clamps, hangers as Specified and as required. The Contractor shall adequately design all the brackets, saddles, anchor, clamps and hangers, and be responsible for their structural stability.

Pipe work and fittings shall be supported by hangers or brackets so as to permit free expansion and contraction. All accessories and ancillaries of support system such as brackets, saddles, clamps, hangers etc. shall be hot dip galvanized after fabrication. Further to permit free movement of common piping, support shall be from a common hanger bar, fabricated from galvanised steel sections.

Pipe hangers shall be provided at the following maximum spacings:

### **Pipe Dia (mm)**

### **Hanger Rod Dia (mm)**

Insulated piping shall be supported in such a manner as not to put undue pressure on the insulation. 14 gauge metal sheets shall be provided between the insulation and the clamp,

Saddle or roller, extending atleast 15 cm. on both sides of the clamps, saddles or roller.

All pipe work shall be carried out in a proper workman like manner, causing minimum disturbance to the existing services, buildings, roads and structure. The entire piping work shall be organized in consultation with other agencies work, so that area can be carried out in one stretch. Cut-outs in the floor slab for installing the various pipes area are indicated in the drawings. Contractor shall carefully examine the cut-outs provided and clearly point out wherever the cutouts shown in the drawings, do not meet with the requirements. Pipe sleeves, larger diameter than pipes, shall be provided wherever pipes pass through walls and slab and annular space filled with fiberglass and finished with retainer rings.

The contractor shall make sure that the clamps, brackets, saddles and hangers provided for pipe supports are adequate or as specified / UTIITSL/Clients. Piping layout shall take due care for expansion and contraction in pipes and include expansion joints where required.

All pipes shall be accurately cut to the required sizes in accordance with relevant BIS codes and burrs removed before laying. Open ends of the piping shall be closed as the pipe is installed to avoid entrance

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of foreign matter. Where reducers are to be made in horizontal runs, eccentric reduces shall be used for the piping to drain freely. In other locations, concentric reduces may be used.

All buried pipes for CWS shall be cleaned and coated with two coats of bitumen and then

Wrapped with two layers of 400 micron polythene sheet coating.

Automatic air valves shall be provided at all high points in the piping system for venting. All valves shall be of 15mm pipe size and shall be associated with an equal size isolation ball valve. Automatic air valves shall also be provided on hot water risers.

Discharge from the air valves shall be piped through a galvanized steel pipe to the nearest drain or sump. All pipes shall be pitched towards drain points.

Pressure gauges shall be provided as shown on the approved drawings and include in Bill of Quantities. Care shall be taken to protect pressure gauges during pressure testing.

Temperature gauge as specified shall be provided at the hot water supply and return and as shown on drawings and included in Bill of Quantities.

## **2. FERRULES**

The ferrules for connection with main shall generally conform to IS:2692. It shall be of nonferrous materials with a bell mouth cover and shall be of nominal bore as specified. The ferrule shall be fitted with a screw and plug or valve capable of completely shutting of the water supply to the communication pipe, as and when required.

### **4.1 Fixing Ferrules**

For fixing ferrule in cast iron mains, the empty main shall be drilled and tapped at 45 deg to the vertical and the ferrule screwed in. The ferrule must be so fitted that no portion of the shank shall be left projecting within the main into which it is fitted.

## **3. WATER METERS**

Water meters of approved make and design shall be supplied for installation at locations as shown. The water meters shall meet with the approval of local supply authorities. Suitable valves and chambers or wall meter box to house the meters shall also be provided along with the meters.

The meters shall conform to Indian Standard IS:779 and IS:2373. Calibration certificate shall be obtained and submitted for each water meter.

Provision shall also be made to lock the water meter. The provision shall be such that the lock is conveniently operated from the top. Where the provision is designed for use in conjunction with padlocks, the hole provided for padlocks shall be a diameter not less than 4mm.

### **5.1 Installation Of Water Meter And Stop Cock**

The G.I. lines shall be cut to the required lengths at the position where the meter and stop cock are required to be fixed. Suitable fittings shall be attached to the pipes. The meter and stop cock shall be fixed in a position by means of connecting pipes, jam nut and socket etc. The stop cock shall be fixed near the inlet of the water meter. The paper disc inserted in the ripples of the meter shall be removed. And the meter installed exactly horizontal or vertical in the flow line in the direction shown by the arrow cast on the body of the meter. Care shall be taken that the factory seal of the meter is not disturbed. Wherever the

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meter shall be fixed to a newly fitted pipe line, the pipe line shall have to be completely washed before fitting the meter.

#### **4. TESTING**

The Contractor shall notify the UTIITSL/BANK three days in advance of any test so that the UTIITSL/BANK can witness the tests if he so wishes.

All water supply system shall be tested to hydrostatic pressure test of at least one and a half (1.5) times the maximum pressure but not less than 10Kg/Sq.cm for a period of not less than 8 hours. All leaks and defects in joints revealed during the testing shall be rectified and got approved at site by retest. Piping required subsequent to the above pressure test shall be retested in the same manner.

System may be tested in sections and such sections shall be entirely retested on completion.

The Contractor shall make sure that proper noiseless circulation of fluid is achieved through the entire piping network of the system concerned. In case of improper circulation, the contractor shall rectify the defective connections. He shall bear all expenses for carrying out the above rectifications including the tearing up and refinishing of floors and walls as required. In addition to the sectional testing carried out during the construction, contractor shall test the entire installation after connections to the overhead tanks or pumping system or mains. He shall rectify all leakages and shall replace all defective materials in the system. Any damage done due to carelessness, open or burst pipes or failure of fittings, to the building, furniture and fixtures shall be made good by the contractor during the defects liability period without any cost. After commissioning of the water supply system, contractor shall test each valve by closing and opening it a number of times to observe if it is working efficiently. Valves which do not effectively operate shall be replaced by new ones at no extra cost and the same shall be tested as above. A test register shall be maintained and all entries shall be signed and dated by UTIITSL/Clients.

#### **5. DISINFECTION OF PIPING SYSTEM AND STORAGE TANKS**

Before commissioning the water supply system, the contractor shall arrange to disinfect the entire system as described in the succeeding paragraph.

The water storage tanks and pipes shall first be filled with water and thoroughly flushed out. The storage tanks shall then be filled with water again and disinfecting chemical containing chlorine added gradually while tanks are being filled to ensure thorough mixing. Sufficient chemical shall be used to give water a dose of 50 parts of chlorine to one million parts of water. If ordinary bleaching powder is used, the proportions will be 150 gm of power to 1000 liters of water. The power shall be mixed with water in the storage tank. If a proprietary brand of chemical is used, the proportions shall be specified by the manufacturer. When the storage tanks are full, the supply shall be stopped and all the taps on the distributing pipes are opened successively working progressively away from the storage tank. Each tap shall be closed when the water discharged begins to smell of chlorine. The storage tank shall then be filled up with water from supply pipe and added with more disinfecting chemical in the recommended proportions. The storage tank and pipe shall then remain charged at least for three hours. Finally the tank and pipes shall be thoroughly flushed out before any water is used for domestic purpose.

The pipe work shall be thoroughly flushed before supply is restored.

#### **6. STERILIZATION OF MAIN**

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After the pipe work has been tested and approved, but before it is coupled, it shall be sterilized with a solution of chloride of lime.

## 7. CUTTING CHASES IN MASONARY WALLS

Cold water distribution pipes to fixtures and equipment exposed to view in the Toilets, kitchens, and sanitary compartments shall be chased into walls or floors or placed in wall cavities. The Contractor shall be responsible for cutting all notches, chases, and recesses in walls and floors and only a diamond cutter shall be used. The maximum size of conduit or pipe permitted to be concealed in floor slabs shall be 32 mm diameter unless otherwise approved by the UTIITSL/Clients.

The chases upto 7.5 x 7.5 cm shall be made in the walls for housing GI pipes etc. These shall be provided in correct positions as shown in the drawings or directed by the UTIITSL/Clients. Chases shall be made by chiselling out the masonry to proper line and depth. After the pipes etc are fixed in chases, the chases shall be filled with cement mortar 1:2:4 or as may be specified, and made flush with the masonry surface. The concrete surface shall be roughened with wire brush to provide a key for plastering.

Where pipes pass through beams or structural walls, subject to the approval of the Structural Consulting Engineer, the Contractor shall ensure that sizes and locations of openings required are formed in when the relevant beams or walls are cast.

## 8. VALVES

All valves (gate, globe, check, safety) shall be of gun metal suitable for the particular service as specified. All valves shall be of the particular duty and design as specified. Valves shall either be of screwed type or flanged type, as specified, with suitable flanges and non-corrosive bolts and gaskets. Tail pieces as required shall be supplied along with valves. Gate, globe and check valves shall conform to Indian Standard IS: 776 and non-return valves and swing check type reflux to IS: 5312. Sluice valves, where specified shall be flanged sluice valves of cast iron body. The spindle, valve seat and wedge nuts shall be gunmetal. They shall generally have non-rising spindle and shall be of the particular duty and design as specified. The valves shall be supplied with suitable flanges, non-corrosive bolts and asbestos fibre gaskets. Sluice valves shall conform to Indian standard IS: 780 and IS: 2906. Ball valves with floats to be fixed in storage tanks shall consist of cast brass lever arm having copper balls (26 SWG) screwed to the arm integrally. The copper ball shall have bronze welded seams. The closing/opening mechanism incorporating the piston and cylinder shall be non-corrosive metal and include washers. The size and construction of ball valves and float shall be suitable for desired working pressure operating the supply system. Where called for brass valves shall be supplied with brass hexagonal back nuts to secure them to the tanks and a socket to connect to supply pipe. Globe valves on Hot-water line shall be union bonnet with stem/disc and body seat ring of SS. Suitable for temperature up to 80° C.

S.No Type of Valve Size Construction Ends

a. Isolating Valve 15 mm to 50 mm 65 mm and above

Gun Metal

Gun Metal

Screwed

Flanged

b. Sluice Valve & Butterfly Valve 65 mm and above Cast Iron Flanged

c. G.M. non return valve 15 mm to 50 mm 65 mm above

Gun Metal

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Gun Metal

Screwed

Flanged

d. Flap Type 6 Non return valve 65 mm and above Cast Iron Flanged

All valves shall be suitable for the working pressure involved.

### **10.1 Pressure Reducing Valve Set**

Each pressure reducing valve set shall be complete with pressure reducing or pressure Regulating valve, isolating valves, pressure gauges on inlet and outlet, pressure relief valve on outlet and filter on inlet. Each pressure reducing valve shall contain loading neoprene diaphragm and a full floating, self aligning, ignition resistant seat and shall be of the single stage, pressure reduction type with provision for manually adjusting the delivery pressure. The valve shall fail safe to the low pressure.

Valves shall be capable of operating at the maintaining automatically the respective delivery pressure and flow rates as indicated and shall not be liable to creep. Valves shall also be capable of maintaining the pre-set down stream pressure under static condition.

The filter on each inlet to a pressure reducing valve shall be of replaceable porous sintered metal type.

### **10.2 Pressure Relief Valves**

Each pressure relief valve shall be of the fully enclosed type and fitted with hand easing gear.

Each pressure relief valve in a pressure reducing station shall have a flow capacity equal to that of the pressure reducing valve.

Pressure relief valves in locations other than reducing stations shall have flow capacities equal to that of the associated equipment.

### **10.3 Pressure Gauge**

The pressure gauge shall be constructed of die cast aluminium and stove enamelled. It shall be weather proof with an IP 55 enclosure. It shall be a stainless steel Bourden tube type pressure gauge with a scale range from 0 to 16 Kg / cm square and shall be constructed as per IS:3524. Each pressure gauge shall have a siphon tube connection. The shut off arrangement shall be by Ball Valve.

Calibration certificate shall be obtained and submitted for each pressure gauge.

## **9. WATER FITTINGS**

Unless otherwise specified all Gunmetal fittings such as gate, globe, check & safety valves shall be fitted in pipe line in workman like manner. Necessary unions shall be provided on both ends of the valves for easy replacement. The joints between fittings and pipes shall be leakproof when tested to desired pressure rating. The defective fittings and joints shall be replaced or redone.

## **12. CONNECTIONS TO VARIOUS MECHANICAL EQUIPMENT SUPPLIED BY OTHER AGENCIES**

All inlets, outlets, valves, piping and other incidental work connected with installation of

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mechanical equipment supplied by other agencies all be carried out by the contractor in accordance with the drawings, requirements for proper performance of equipment, manufacturers instructions and the directions of the UTIITSL/Clients. The equipments to be supplied by the other agencies consist mainly for Kitchen, Back-of-the-House area and other similar areas. The work of connections to the various equipments shall be effected through proper unions and isolating valves. The work of effecting connections shall be executed in consultation with and according to the requirement of equipment suppliers, under the directions of the UTIITSL/Clients. The various aspects of connection work shall be executed in a similar way to the work of respective trade mentioned elsewhere in these specifications.

#### **14. CONNECTIONS TO RCC WATER TANKS**

##### **15.**

The contractor shall provide all inlets, outlets, washouts, vents, ball cocks, overflows control valves and all such other piping connections including level indicator to water storage tanks as called for.

All pipes crossing through RCC work shall have puddle flanges fabricated from MS/GI pipes of required size and length and welded to 6/8 mm thick MS plate. All puddle flanges must be fixed in true alignment and level to ensure further connection in proper order. Full way gate valves of a approved make shall be provided as near the tank as practicable on every outlet pipe from the storage tank except the overflow pipe. Overflow and vent pipes shall terminate with mosquito proof grating.

The overflow pipe shall be so placed to allow the discharge of water being readily seen. The overflow pipe shall be of size as indicated. A stop valve shall also be provided in the inlet water connection to the tank. The outlet pipes shall be fixed approximately 75mm above the bottom of the tank towards which the floor of the tank is sloping to enable the tank to be emptied for cleaning.

The floor and the walls of the tank shall be tiled with glazed tiles upto the overflow level.

Alternatively food grade epoxy to be applied.

#### **Tiling of Walls**

The floor and the walls of the tanks shall be tiled with glazed tiles up to the overflow level. Alternatively food grade epoxy to be applied to the floor and the walls of the tanks.

#### **16. MEASUREMENTS**

##### **17.**

The length above ground shall be measured in running meter correct to a cm for the finished work, which shall include pipe and fittings such as coupling , bends, tees, elbows, reducers, crosses, plugs, sockets, nipples and nuts, unions. Deductions for length of valves shall be made. Rate quoted shall be inclusive of all fittings, clamps, cutting holes chased and making good the same and all items mentioned in the specifications and Bill of Quantities.

All pipes below ground shall be measured per linear meters (to the nearest cm) and shall be inclusive of all fittings e.g. coupling, tees, bends, elbows, unions, deduction for valves shall be made rate quoted shall be inclusive of all fittings, excavation, back filling and disposal of surplus earth, cutting holes and chase and making good all item mentioned in Bill of Quantities.

#### **18. LAWN HYDRANTS**

Lawn hydrants shall be of 25mm size unless otherwise indicated. All hydrants shall be provided with gate valves and threaded nipple to receive hose pipes. Lawn hydrant valves



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shall be of approved make and design. Where called for lawn hydrants shall be located in masonry chambers of appropriate size.

## **16. PIPE PROTECTION (FOR COLD WATER PIPES BURIED IN TRENCHES / GROUND / EARTH)**

All buried pipes shall be cleaned with zinc chromate primer and bitumen paint, wrapped with three layers of fiber glass tissue, each layer laid in bitumen and placed on concrete blocks with PUF saddles dipped in bitumen at every 2 meters. The pipes where laid under floor shall be encased with 100 mm thick jamuna sand all around in addition to protective coating as described above. Alternatively pypcoat / coatek insulation for protection of pipe would also be acceptable as per final approval of UTITSL/Clients.

## **19. THRUST BLOCKS**

In case of bigger pipes (80 mm dia and above), thrust blocks of cement concrete 1:2:4 (1 cement: 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) shall be constructed on all bends as directed by the UTITSL/Clients.

## **18. MASONRY CHAMBER**

- i. All masonry chambers for stop cocks, sluice valves and meter etc. shall be built as per supplied drawings.
- ii. The excavation for chambers shall be done true to dimension and level indicated on plans or as directed by the Owner's site representative.
- iii. Concrete shall be of cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size).
- iv. Brick shall be of class designation 75 in cement mortar 1:5 (1 cement : 5 fine sand)
- v. Inside Plastering not less than 12 mm thick shall be done in cement mortar 1:3 (1 cement : 3 fine sand) finished with a floating coat of neat cement.

## **20. SHIFTING OF EXCAVATED SURPLUS MATERIAL**

### **21.**

Contractor shall make his own arrangement to shift the surplus excavated material within the site limits as directed by UTITSL/Clients at free of cost within time limit.

## **SECTION-04::INTERNAL DRAINAGE (SOIL, WASTE, VENT & RAIN WATER PIPES)**

### **1. SCOPE**

The scope of this section comprises the supply, installation, testing and commissioning of internal drainage services. Work under this section shall consist of furnishing all labour, materials, equipments and appliances necessary and required to completely install all soil, waste, vent and rainwater pipes and fittings as required by the drawings, and given in the schedule of quantities.

### **2. BASIC PIPING SYSTEM**

Soil, waste and vent pipes in shafts, ducts and in concealed areas i.e. false ceilings etc. shall consist of cast iron pipes & fittings as called for. In general wastes and vents smaller than and upto 50mm dia shall be of heavy class GI.

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The soil pipes shall be circular with a minimum diameter of 100mm. Pipes shall be fixed by means of stout GI clamps in two sections, bolted together, built into the walls, wedged and neatly jointed as directed and approved by the UTITSL/Clients. All bends, branches, swan neck and other parts shall conform to the requirement and standards as described for the pipes. Pipes shall be rested against the walls on suitable wooden cradles. Local authority regulations applicable to the installations shall be strictly followed.

Where indicated, the soil pipes shall be continued upwards without any diminution in its diameter, without any bend or angle to the height shown in the drawings. Joints throughout shall be made with molten lead as described under jointing of cast iron pipes. Soil pipes shall be painted as provided under 'painting'. The soil pipes shall be covered on top with cast iron terminal outlets as directed and approved. All vertical soil pipes shall be firmly fixed to the walls with properly fixed clamps, and shall as far as possible be kept 50mm clear of wall. Waste pipes and fittings shall be of cast iron or galvanised mild steel pipes. Pipes shall be fixed, jointed and painted as described in installation of soil, waste & vent pipes.

Every waste pipe shall discharge above the grating of properly trapped gully. The contractor will ensure that this requirement is adequately met with. Wherever floor traps are provided, it shall be ensured that atleast one wash is connected to such floor traps to avoid drying of water seal in the trap. Ventilating pipes shall be of cast iron or galvanised mild steel pipes, conforming to the requirements laid down earlier. Anti-syphon vent pipes/relief vent pipes where called for on the drawings shall be of cast iron or galvanised mild steel pipes as specified. The pipes shall be of the diameter shown on the drawings.

All traps on branch soil and waste pipes shall also be ventilated at a point not less than 75mm or more than 300mm from their highest part and on the side nearest to the soil pipe or waste pipes.

Access doors for fittings and clean outs shall be so located that they are easily accessible for repair and maintenance. Any access panel required in the civil structure, false ceiling or marble cladding etc. shall be clearly reported to the Owner in the form of shop drawings so that other agencies are instructed to provide the same.

All the fittings used for connections between soil, waste and ventilation pipes and branch pipes shall be made by using pipe fittings with inspection doors for cleaning. The doors shall be provided with 3mm thick rubber insertion packing and when closed and bolted shall be air and water tight. Where soil, waste and ventilating pipes are accommodated in shafts ducts, adequate access to cleaning eyes shall be provided.

Head (starting point) of drains and sewage / waste water sumps (as and where applicable) having a length of greater than 4 m upto it connection to the main drain or manhole shall be provided with a 80 / 100 mm vent pipe.

### **3. PIPING MATERIALS**

#### **3.1 Cast Iron Pipes**

Cast iron pipes and fittings shall be of good and tough quality and dark grey on fracture. The pipes and fittings shall be true to shape, smooth and cylindrical, their inner and outer surface being as nearly as practicable concentric. They shall be sound and nicely cast, shall be free from cracks, taps, pinholes and other manufacturing defects.

The pipes and fittings shall conform to IS:3989 / IS:1729 as called for. Fittings shall be of required degree with or without access door. All access doors shall be made up with 3mm thick insertion rubber gasket of white lead and tightly bolted to make the fittings air and water tight. The fittings shall be of the same manufacture as the pipes used for soil and waste.

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All CI pipes and fittings shall bear the manufacturer's name and ISI specification to which it conforms.

All pipes and fittings shall be coated internally and externally with the same material at the factory, the fittings being preheated prior to total immersion in a bath containing a uniformly heated composition having a tar/other suitable base. The coating material shall have good adherence and shall not scale off. The coating shall be smooth and tenacious and hard enough not to flow when exposed to a temperature of 77 degree C but not so brittle at a temperature of '0' degree C as to chip off when scratched lightly with a pen knife.

All pipes and fittings before installation at site shall be tested hydrostatically to a pressure of 0.45 Kg/sq. cm without showing any sign of leakage, sweating or other defects of any kind. The pressure shall be applied internally and shall be maintained for not less than 15 minutes. All these tests shall be carried out in the presence of the representative of the Project Manager. Alternatively a test certificate from manufacturers be obtained before dispatch of material to site. Cast Iron Specialities

If required, Cast iron speciality items such as deep seal floor traps, urinal traps, trap integral pieces with integral inlet/outlet connections, manhole cover with frame, chamber cover etc. shall be fabricated to suit individual location requirements. The contractor shall arrange the fabrication of these items from an approved source.

Lead Caulked joints with pig lead:

The approximate depth and weights of pig lead for various diameters of CI pipes and specials shall be as follows:

Nominal size of Pipe (mm) Lead per Joint (Kg) Depth of Lead Joint (mm)

50 0.77 25

80 0.88 25

100 0.99 25

150 1.5 38

### **Drip Seal Joints :**

Drip seal PJS-43 (pipe joint sealant) shall be used for joining various diameters of C.I. pipes and specials. This sealant replaces the standard Drip seal caulked joints. The application is by Homogenously mixing the two pack system in cold condition. Drip seal PJS - 43 is the proprietary item of

### **Application Procedure:**

Clean the pipe joints thoroughly to ensure it is free from any traces of oil, dirt or any other foreign body. Mix two parts of Drip Seal thoroughly with an iron flat to get a homogenous compound. Place Spun yarn in the pipe joint as a filler and then take the required quantity of the compound and push it in the joint with a caulking tool, MS flat / damp finger uniformly all over to obtain smooth and uniform joint. Dip the fingers in water every often to ensure the compound does not stick to the hands of the workmen, but this will ensure perfect sealing and the smooth surface for the joint cement. (\* The compound prepared from the two mixtures is to be used within 30 minutes) Precaution to be taken to wash hands thoroughly with soap before and after use. Preferably use disposable gloves for hand application.

### **3.2 Galvanised Iron Pipes**

Waste pipes of 50mm dia and below and where called for shall be galvanized iron pipes screwed and socketed conforming to the requirements of IS:1239 of heavy grade. The pipes and sockets shall be

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cleanly finished, well galvanized in and out and free from cracks, surface flaws, laminations and other defects. All screw thread shall be clean and well cut. All pipes and fittings shall bear manufacturer's trade mark and conform to the IS as specified.

### 3.3 UPVC Pipes and Fittings

#### 3.4

The pipes shall be round and shall be supplied in straight lengths with socketed ends. The internal and external surfaces of pipes shall be smooth, clean, and free from groovings and other defects. The ends shall be cleanly cut and square with the axis of the pipe. The pipes shall be designed by external diameter and shall conform to IS:4985-1981. The pipes shall be of Class-III; 6 Kg/sqm pressure rating. Fittings shall be of the same make as that of pipes, injection moulded and shall conform to Indian Standard.

#### Laying and Jointing

The pipes shall be laid and clamped to wooden plugs fixed above the surface of the wall.

Alternatively plastic clamps of suitable designs shall be preferred. Provision shall be made for the effect of thermal movement by not gripping or disturbing the pipe at supports between the anchors for suspended pipes. The supports shall allow the repeated movements to take place without abrasion.

Jointing for UPVC pipes shall be made by means of solvent cement for horizontal lines and  $\pm$ OØ rubber ring for vertical line. The type of joint shall be used as per site conditions / direction of the UTIITSL/Clients. Where UPVC pipes are to be used for rain water pipes, the pipe shall be finished with GI adpoter for insertion in the RCC slab for a water proof joint complete as directed by UTIITSL/Clients.

Supports UPVC pipes require supports at close intervals. Recommended support spacing for unplasticised PVC pipes is 1400 mm for pipes 50 mm dia and above. Pipes shall be aligned properly before fixing them on the wooden plugs with clamps. Even if the wooden plugs are fixed using a plumb line, pipe shall also be checked for its alignment before clamping, piping shall be properly supported on, or suspended from clamps, hangers as specified and as required. The Contractor shall adequately design all the brackets, saddles, anchors, clamps and hangers and be responsible for their structural sufficiency. Pipe supports shall be primer coated with rust preventive paint.

Repairs While temporary or emergency repairs may be made to the damaged pipes, permanent repairs shall be made by replacement of the damaged section. If any split or chip out occur in the wall of the pipe, a short piece of pipe of sufficient length to cover the damaged portion of the pipe is cut.

The sleeve is cut longitudinally and heated sufficiently to soften it so that it may be slipped over the damaged hard pipe.

### 3.5 Cast Iron Class (LA) pipes

#### 3.6

All drainage passing under building floor and passing through retaining wall shall be cast iron class (LA) pipes (IS : 1536)

Cast iron class (LA) pipe shall be such that they could be cut, drilled or machined. Pipe centrifugally cast in unlined water cooled moulds shall be heat treated in order to achieve the necessary mechanical properties and to relieve casing stress; provided that the specified mechanical properties are satisfied.

Material Cast iron pipe shall be centrifugally spun cast iron pipe and conforming to IS:1536-1976 Fittings

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Fittings shall be used for cast iron class (LA pipes shall conform to IS:1538-1976). Whenever possible junction from branch pipe shall be made by wyes.

All cast iron water main pipes and fittings shall be manufactured to IS:1536 of tested quality. The pipes and fittings shall either be spigot and socket type or as called for. The pipes and fittings shall be of uniform material throughout and shall be free from all manufacturing defects.

Joints Cast iron class (LA) pipe used for soil and waste pipes shall be jointed with **drip seal** / lead joints sufficient skein of jute rope shall be caulked to leave minimum space of 25 mm for the **drip seal**.

Lead to be poured in. Laying

i. Fittings used for CI drainage pipe shall conform to IS:1538-1976. Wherever possible junction from branch pipes shall be made by a Y/tee.

### **Drip Seal Joints :**

Drip seal PJS-43 (pipe joint sealant) shall be used for joining various diameters of C.I. pipes and specials. This sealant replaces the standard Drip seal caulked joints. The application is by Homogenously mixing the two pack system in cold condition. Drip seal PJS - 43 is the proprietary

### **Application Procedure:**

Clean the pipe joints thoroughly to ensure it is free from any traces of oil, dirt or any other foreign body. Mix two parts of Drip Seal thoroughly with an iron flat to get a homogenous compound. \* Place Spun yarn in the pipe joint as a filler and then take the required quantity of the compound and push it in the joint with a caulking tool, MS flat / damp finger uniformly all over to obtain a smooth and uniform joint. Dip the fingers in water every often to ensure the compound does not stick to the hands of the workmen, but this will ensure perfect sealing and the smooth surface for the joint cement. (\* The compound prepared from the two mixtures is to be used within 30 minutes) Precaution to be taken to wash hands thoroughly with soap before and after use. Preferably use disposable gloves for hand application.

ii. Lead Caulked joints with pig lead :

The approximate depth and weights of pig lead for various diameters of CI pipes and specials shall be as follows:

Nominal size of Pipe (mm) Lead per Joint (Kg) Depth of Lead Joint (mm)

80 1.8 45

100 2.2 45

125 2.6 45

150 3.4 50

200 5.0 50

250 6.1 50

iii. The spigot of pipe of fittings shall be centered in the adjoining socket by caulking. Sufficient turns of tarred gasket shall be given to leave a depth of 45 mm when the gasket has been caulked tightly home. Joining ring shall be placed round the barrel and against the face of the socket. Molten Lead shall then be poured to the remainder of the socket.

iv. For lead wool joints the socket shall be caulked with tarred gasket, as explained above.

The lead wool shall be inserted into the sockets and tightly caulked home skin by skin with suitable tools and hammers of not less than 2 Kg weight until joint is filled

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#### 4. PIPES HANGERS, SUPPORTS, CLAMPS ETC.

All vertical pipes shall be fixed by galvanized clamps and galvanized angle brackets truly vertical. Branch pipes shall be connected to the stack at the same angle as that of the fittings. No collars shall be used on vertical stacks. Each stack shall be terminated at top with a cowl (terminal guard). Horizontal pipes running along ceiling shall be fixed on galvanized structural adjustable clamps of special design shown on the drawings or as directed. Horizontal pipes shall be laid to uniform slope and the clamps adjusted to the proper levels so that the pipes fully rest on them. Contractor shall provide all sleeves, openings, hangers, inserts during the construction. He shall provide all necessary information to the building contractor for making such provisions in the structure as necessary. All damages shall be made good to restore the surfaces.

All pipes clamps, supports and hangers shall be galvanized. Factory made prefabricated clamps shall be preferred. Contractor may fabricate the clamps of special nature and galvanize them after fabrication but before installation. All nuts, bolts, washers and other fasteners shall be factory galvanized.

Clamps shall be of approved design and fabricated from MS flats (which shall be galvanized after fabrication) of thickness and sizes as per drawings or contractor's shop drawings. Clamps shall be fixed in accordance to manufacturer's details/shop drawings to be submitted by the contractors.

When required to be fixed on RCC columns, walls or beam they shall be fixed with approved type of galvanized expansion anchor fasteners (Dash fasteners) of approved design and size according to load. Structural clamps e.g., trapeze or cluster hangers shall be fabricated by electro-welding from MS structural members e.g. rods, angles, channels flats as per contractor's shop drawings shall be galvanized after fabrication. All nuts, bolts and washers shall be galvanized. Galvanized slotted angle/channel of approved sizes supports on walls shall be provided wherever shown on shop drawings. Angles/channels shall be fixed to brick walls with bolts embedded in cement concrete blocks and to RCC walls with anchor fasteners mentioned above. The spacing of support bolts on support members fixed horizontally shall not exceed 1 m.

#### 5. INSTALLATION OF SOIL, WASTE & VENT PIPES

Soil, waste & vent pipes in shafts under the floors / suspended below slab shall consist of cast iron pipes as described earlier. Waste pipes from bottle trap to floor/urinal traps for wash basin, urinal and sink shall be GI pipes and fittings.

All Horizontal pipes running below the slab and along the ceiling, shall be fixed on structural adjustable clamps, sturdy hangers of the design as called for in the drawings. The pipes shall be laid in uniform slope and proper levels. All vertical pipes shall be truly vertical fixed by means of stout clamps in two sections, bolted together, built into the walls, wedged and neatly jointed. The branch pipes shall be connected to the stack at the same angle as that of fittings. All connections between soil, waste and ventilating pipes and branch pipes shall be made by using pipe fittings with inspection doors for cleaning. Pipes shall be fixed in a manner as to provide easy accessibility for repair and maintenance and shall not cause obstruction in shafts. Where the horizontal run off the pipe is long or where the pipes cross over building expansion joints etc. suitable allowance

shall be provided for any movements in the pipes by means of expansion joint etc. such that any such movement does not damage the installation in any way.

All cast iron pipes and fittings shall be jointed with drip seal / Best Quality pig lead free from impurities conforming to IS 27.

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Before jointing, the interior of the socket and exterior of the spigots shall be thoroughly cleaned and dried. The spigot end shall be inserted into the socket right up to the back of the socket and carefully centered by two or three laps of threaded spun yarn, twisted into ropes of uniform thickness, well caulked into the back of the socket. No piece of yarn shall be shorter than the circumference of the pipe. The jointed pipe line shall be at required levels and alignment. The remainder of the socket is left for the lead caulking. Where the gasket has been tightly held, a jointing ring shall be placed round the barrel against the face of the socket. Molten Lead shall be poured to the remainder of the socket.

The depth of the lead joints for the cast iron pipes shall be 45mm for the pipes upto 100mm dia and 50mm for the pipes beyond 100mm dia respectively.

The joint shall not be covered till the pipe line has been tested under pressure. Rest of pipe line shall be covered so as to prevent the expansion and contraction due to variation in temperature.

Rainwater Pipes All open terraces shall be drained by rain water down takes.

Rainwater down takes are separate and independent of the soil and waste system and will discharge into the underground storm water drainage system of the complex. Rainwater in open courtyards shall be collected in catch basins and connected to the Storm Water

Drains. Any dry weather flow from waste appliances, e.g. AHUs pump rooms, waste water sumps shall be connected to sewers after traps and not in the storm water drainage systems.

Balcony / Planter drainage

Wherever required, all balconies, terraces, planters and other frontal landscape areas will be drained by vertical down takes or other type of drainage system shown on the drawings and directed by the UTITSL/Clients.

## **6. TRAPS**

### **6.1 Floor Traps**

Floor traps where specified shall be siphon type full before P or S type cast iron having a minimum 50 mm deep seal. The trap and waste pipes when buried below ground shall be set and encased in cement concrete blocks firmly supported on firm ground or when installed on a sunken RCC structural slab. The blocks shall be in 1:2:4 mix (1 cement : 2 coarse sand : 4 stone aggregate 20 mm nominal size).

Contractor shall provide all necessary shuttering and centering for the blocks. Size of the block shall be 30 x 30 cms of the required depth.

### **6.2 Floor Trap Inlet /Hopper**

Bath room traps and connection shall ensure free and silent flow of discharging water. Where specified, contractor shall provide a special type of floor inlet fitting fabricated from GI pipe, with one, two or three inlet sockets welded on side to connect the waste pipe. All joint between waste hopper and CI inlet socket shall be drip seal/Lead Caulked. Inlet shall be connected to a CI trap. Floor trap inlet and the traps shall be set in cement concrete blocks where buried in floors without extra charge. Floor trap for the shower cubicle shall suit site and as per the approval of UTITSL/Clients. All fabricated hopper shall be hot dip galvanized.

### **.3 Floor Trap Grating**

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Floor and urinal traps shall be provided with 100 6 150 mm square or round stainless steel gratings, with frame and rim of approved design and shape or as specified in the schedule of quantities approved by the UTIITSL/Clients.

#### **6.4 Cleanout Plugs**

Floor Clean out Plug Clean out plug for soil, waste or rain water pipes laid under floors shall be provided near pipe junctions bends, tees, 6Y6 and on straight runs at such intervals as required as per site conditions.

Cleanout plugs shall terminate flush with the floor level. They shall be threaded and provided with key holes for opening. Cleanout plugs shall be cast brass suitable for the pipe dia. With screwed to a GI socket. The socket shall be drip seal joined/ Lead Caulked to the drain pipes. Cleanout on Drainage Pipes Cleanout plugs shall be provided on head of each drain and in between at locations indicated on plans or directed by Owner's site representative. Cleanout plugs shall be of size matching the full bore of the pipe but no exceeding 150 mm dia CO plugs on drains of greater diameters shall be 150 mm dia. Fixed with a suitable reducing adapter.

Floor cleanout plugs shall be cast brass.

Cleanouts provided at ceiling level pipe shall be fixed to a CI flanged tail piece. The cleanout doors shall be specially fabricated from light weight galvanized sheets and angles with hinged type doors with fly nuts, gasket etc. as per drawing.

#### **7. PIPE SLEEVES**

Pipe sleeves, next larger diameter than pipes shall be provided wherever pipes pass through walls & slabs and annular space filled with fiberglass & finished with retainer rings. All pipes shall be accurately cut to the required sizes in accordance with relevant BIS codes and burrs removed before laying. Open ends of the pipe shall be closed as the pipe is installed to avoid entrance of foreign matter.

#### **8. PIPE PROTECTION**

Cast iron soil and waste pipes under floor in sunken slabs and in wall chases (when cut specially for the pipe) shall be encased in cement concrete 1:2:4 mix (1 cement : 2 coarse sand : 4 stone aggregate of 12 mm size) 10 cm bed and around. When pipes are running well above the structural slabs, the encased pipes shall be supported with suitable cement concrete pillars of required height and size at intervals directed by the Project Manager.

#### **9. CUTTING AND MAKING GOOD**

Pipes shall be fixed and tested as building proceeds. The contractor shall provide all necessary holes, cutouts and chases in structural members as building work proceeds. Wherever holes are cut or left originally they shall be made good with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 stone aggregate 20 mm nominal size) or cement mortar 1:2 (1 cement : 2 coarse sand). Cured and the surface restored to original condition.

#### **10. PAINTING**

##### **11.**

Soil, waste, vent and rain water pipes in exposed location, in shafts and pipe space shall be painted with two or more coats of ready mix oil paint to give an even shade. Before painting all dust and extraneous matter shall be removed.

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Paint shall be of approved quality and shade. Where directed by the UTITSL/Clients pipes shall be painted in accordance with approved pipe colour code.

Pipe in chase shall be painted with two coats of bitumen paint, covered with polythene tape and a final coat of bitumen paint. Exposed pipes shall be painted with synthetic enamel paint after removing dust and extraneous matter.

C.I. Soil and waste pipes below ground and covered in cement concrete shall not be painted.

## **11. TESTING**

### **12.**

Testing shall be done in accordance with IS:1172 and IS:5329 except as may be modified herein under. Entire drainage system shall be tested for water tightness and smoke tightness during and after completion of the installation. No portion of the system shall remain untested. Contractor must have adequate number of expandable rubber bellow plugs, manometers, smoke testing machines,

pipe and fitting work tests,

All materials obtained and used on site must have manufacturer's hydraulic test certificate for each batch of materials used on the site.

Before use at site all CI pipes shall be tested by filling up with water for at least 30 minutes. After filling, pipes shall be struck with a hammer and inspected for blow holes and cracks. All defective pipes shall be rejected and removed from the site within 48 hours. Pipes with minor sweating may be accepted at the discretion of the Project Manager.

Soil and waste pipes shall be tested in sections after installation, by filling up the stack with water.

All openings and connections shall be suitably plugged as approved by the Project Manager. The total head in the stack shall be 4.5 m at the highest point of the section under test. The period of test shall be minimum for 30 minutes or as directed by the Project Manager. If any leakage is visible, the defective part of the work shall be cut out and made good.

On completion of the work the entire installation shall be tested by smoke testing machine. The test shall be conducted after the plumbing fixtures are installed and all traps have water seal or by plugging the outlets with bellow plugs. Apply dense smoke keeping the top of stack open and observe for leakages. Rectify or replace defective sections.

After the installation is fully complete, it should be tested by flushing the toilets, running atleast 20% of all taps simultaneously and ensuring that the entire system is self draining, has no leakages, blockages etc. rectify and replace where required.

A test register shall be maintained and all entries shall be signed and dated by the Contractor and the Project Manager or his representative.

All pipes in wall chase or meant to be encased or burried shall be hydro tested before the chase is plastered or the pipe encased or burried.

## **SECTION-05:: EXTERNAL DRAINAGE (SEWAGE & STORM WATER DISPOSAL)**

### **1. SCOPE**

#### **2.**

The scope of this section comprises the supply, installation, testing and commissioning of external drainage & sewage disposal services.

### **1.1 General Scheme**

#### **1.2**

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The contractor shall install a drainage system to effectively collect, drain and dispose all soil and waste water from various parts of the buildings, appurtenances and equipment. The piping system shall finally terminate and discharge into the STP. The piping work mainly consists of laying of Salt glazed stoneware pipes, reinforced cement concrete pipes and cast iron soil pipes as called for on the drawings. All piping shall be installed at depth greater than 80 cm below finished ground level.

The disposal system shall include construction of gully traps, manholes, intercepting chambers as indicated. The piping system shall be vented suitably at the starting point of all branch drains, main drains, the highest/lowest point of drain and at intervals as shown. All ventilating arrangements shall be unobstructive and concealed. The work shall be executed strictly in accordance with IS:

1742. The sewage system shall be subject to smoke test for its soundness as directed by the Project Manager. Wherever the sewerage pipes run above water supply lines, same shall be completely encased in cement concrete 1:2:4 all round with the prior approval of the Project Manager.

Without restricting to the generality of the foregoing, the drainage system shall inter-alia include: a. Sewer lines including earth work for excavation, disposal, back filling and compaction, pipe lines, manholes, drop connections and connections to the municipal or existing sewer.

b. Storm water drainage, earth works for excavation, disposal, backfilling and compaction, pipe lines, manholes, catch basins and connections to the existing municipal storm water drain or connected as indicated by the UTIITSL/Clients.

## **General Requirements**

All materials shall be new and of quality conforming to specifications and subject to the approval of the UTIITSL/Clients. Wherever particular makes are mentioned, the choice of selection shall remain with the Architect / Consultant / UTIITSL/Clients. Drainage lines and open drains shall be laid to the required gradients and profiles.

All drainage work shall be done in accordance with the local municipal bye-laws.

Contractor shall obtain necessary approval and permission for the drainage system from the municipal or any other competent authority.

Location of all manholes, etc shall be got confirmed by the UTIITSL/Clients before the actual execution of work at site. As far as possible, no drains or sewers shall be laid in the middle of road unless otherwise specifically shown on the drawings or directed by the UTIITSL/Clients in writing.

All materials shall be rust proofed; materials in direct or indirect contact shall be compatible to prevent electrolytic or chemical (bimetallic) corrosion.

## **2. TRENCHING FOR PIPES AND DRAINS**

### **2.1 General**

All the material shall be new of best quality conforming to specifications and subject to the approval of the Architects. Drainage lines shall be laid to the required gradients and profiles. All drainage work shall be done in accordance with the local municipal by-laws.

Contractor shall obtain necessary approval and permission for the drainage system from the municipal or any other competent authority. Location of all manholes, catch basins etc. shall be finalized and shown in approved shop drawings before the actual execution of work at site. All work shall be executed as directed by the UTIITSL/Clients.

### **2.2 Alignment & Grade**

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The sewer and storm water drainage pipes shall be carefully laid to levels and gradients shown in the plans and sections but subject to modifications as shall be ordered by the Architects from time to time to meet the requirements of the works. Great care shall be taken to prevent sand etc. from entering the pipes. The pipes between two manholes shall be laid truly in straight lines without vertical or horizontal undulations. The body of the pipes shall rest on an even bed in the trench for its length and places shall be excavated to receive collar for the purpose of jointing. No deviations from the lines, depths of cuttings or gradients as called for on the drawings shall be permitted without the written approval of the Architect. All pipes shall be laid at least 60cms below the finished ground level or as called for on the drawings.

### **2.3 Setting out Trenches**

The contractor shall set out all trenches, manholes, chambers and such other works to true grades and alignments as called for. He shall provide the necessary instruments for setting out and verification for the same. All trenches shall be laid to true grade and in straight lines and as shown on the drawings. The trenches shall be laid to proper levels by the assistance of boning rods and sight rails which shall be fixed at intervals not exceeding 10 meters or as directed by the UTIITSL/Clients.

### **2.4 Trench Excavation**

The trenches for the pipes shall be excavated with bottoms formed to level and gradients as shown on the drawings or as directed by the UTIITSL/Clients. In soft and filled in ground, the Project Manager may require the trenches to be excavated to a greater depth than the shown on the drawings and to fill up such additional excavation with concrete (1:4:8) consolidated to bring the excavation to the required levels as shown on the drawings.

All excavations shall be properly protected where necessary by suitable timbering, piling and sheeting as approved by the UTIITSL/Clients. All timbering and sheeting when withdrawn shall be done gradually to avoid falls. All cavities be adequately filled and consolidated. No blasting shall be allowed without prior approval in writing from the Architect. It shall be carried out under thorough and competent supervision, with the written permission of the appropriate authorities taking full precautions connected with the blasting operations. All excavated earth shall be kept clear of the trenches to a distance equal to 75 cms.

### **2.5 Timbering of Sewer and Trenches**

The Contractor shall at all times support efficiently and effectively the sides of all the trenches and other excavations by suitable timbering, piling and sheeting and they shall be close timbered in loose or sandy starta and below the surface of the sub soil water level.

All timbering, sheeting and piling with their wallings and supports shall be of adequate dimensions and strength and fully braced and strutted so that no risk of collapse or subsidence of the walls of the trench shall take place.

The Contractor shall be held responsible and shall be accountable for the sufficiency of all timbering, bracings, sheeting and piling used and also for, all damage to persons and property resulting from improper quality strength placing, maintaining or removing of the same.

### **2.6 Shoring of Buildings**

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The Contractor shall shore up all buildings, walls and other structures, the stability of which is liable to be endangered by the execution of the work and shall be fully responsible for all damages to persons or property resulting from any accident.

## **2.6 Obstruction Road**

The contractor shall not occupy or obstruct by his operation more than one half of the width of any road or street and sufficient space shall then be left for public and private transit. He shall remove the materials excavated and bring them back again when the trench is required to be refilled. The contractor shall obtain the consent of the UTIITSL/Clients in writing before closing any road to vehicular traffic and the foot walks must be clear at all times.

## **2.7 Protection of Pipes etc.**

2.8

All pipes, water mains, cables etc. met in the course of excavation shall be carefully protected and supported. Care shall be taken not to disturb the cables, the removal of which shall be arranged by the contractor with the written consent from the UTIITSL/Clients.

## **2.9 Trench Back Filling**

Refilling of the trenches shall not be commenced until the length of pipes therein has been tested and approved. All timbering which may be withdrawn safely shall be removed as filling proceeds.

Where the pipes are unprotected by concrete hunching, selected fine material shall be carefully hand-packed around the lower half of the pipes so as to buttress them to the sides of the trench.

The refilling shall then be continued to 150mm over the top of the pipe using selected fine hand packed material, watered and rammed on both sides of the pipes with a wooden hammer. The process of filling and tamping shall proceed evenly in layers not exceeding 150mm thickness, each layer being watered and consolidated so as to maintain an equal pressure on both sides of the pipe line. In gardens and fields the top solid and turf if any, shall be carefully replaced.

## **2.10 Contractor to restore settlement and Damages**

The contractor shall at his own costs and expenses, make good promptly during the whole period for the works in hand if any settlement occurs in the surfaces of roads, beams, footpaths, gardens, open spaces etc. in the public or private areas caused by his trenches or by his other excavations and he shall be liable for any accident caused thereby. He shall also, at his own expense and charges, repair (and make good) any damage done to building and other property. If in the opinion of the Project Manager he fails to make good such works with all practicable dispatch, the Project Manager shall be at his liberty to get the work done by other means and the expenses thereof shall be paid by the contractor or deducted from any money that may be or become due to him or recovered from him by any other manner according to the laws of land.

The contractor shall at his own costs and charges provide places for disposal of all surplus materials not required to be used on the works. As each trench is refilled, surplus soil shall be immediately removed, the surface shall be properly restored and roadways and sides shall be left clear.

## **2.11 Removal of Water from Sewer, Trench etc.**

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The contractor shall at all times during the progress of work keep the excavations free from water which shall be disposed by him in a manner as will neither cause injury to the public health nor to the public or private property nor to the work completed or in progress nor to the surface of any road or streets, nor cause any interference with the use of the same by the public.

If any excavation is carried out at any point or points to a greater width of the specified cross section of the sewer with its cover, the full width of the trench shall be filled with concrete by the contractor at his own expense and charges to the requirements of the UTIITSL/Clients.

#### 2.11 Removal of Filth

All night soil, filth or any other offensive matter met with during the execution of the works, shall not be deposited on the surface of any street or where it is likely to be a nuisance or passed into any sewer or drain but shall be immediately, after it is taken out of any trench, sewer or cess pool, put into the carts and removed to a suitable place to be provided by the Contractor.

#### 2.12 Width of Trench

The Project Manager shall have power by giving an order in writing to the Contractor to increase the maximum width/depth for excavation and backfilling in trenches for various classes of sewer, manholes and other works in certain length to be specifically laid down by him, where on account of bad ground on other unusual conditions, he considers that such increased width/depths are necessary in view of the site conditions.

### 3. PIPING MATERIAL

#### 3.1 RCC pipes

All pipes shall be centrifugally spun RCC pipes NP2. Pipes shall be true and straight with uniform bore throughout. Cracked, warped pipes shall not be used on the work. All pipes shall be tested by the manufacturer and the Contractor shall produce, prior to use on site, a certificate to that effect from the manufacturer.

The pipes shall be with or without reinforcement as required and of the class as specified. These shall conform to IS:458-1971.

All pipes shall be true to shape, straight, perfectly sound and free from cracks and flaws. The external and internal surface of the pipes shall be smooth and hard. The pipes shall be free from defects resulting from imperfect grading of the aggregate mixing or moulding.

#### Laying

RCC spun pipes shall be laid on cement concrete bed of cradles as specified and shown on the detailed drawings. The cradles may be precast and sufficiently cured to prevent cracks and breakage in handling. The invert of the cradles shall be left 12 mm below the invert level of the pipe and properly placed on the soil to prevent any disturbance. The pipe shall then be placed on the bed concrete or cradles and set for the line and gradient by means of sight rails and boning rods, etc. Cradles or concrete bed may be omitted, if directed by the UTIITSL/Clients.

#### Jointing

Semi flexible type collar joint.

Hemp rope soaked in neat cement wash shall be passed round the joint and inserted in it by means of caulking tool. More skein of yarn shall be added and rammed home. Cement mortar with one part of

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cement and two part of sand and with minimum water content but on no account soft or sloppy, shall be carefully inserted, punched and caulked into the collar and more cement mortar added until the space of the collar has been filled completely with tightly caulked mortar. Provision of rubber sealing ring in the collar joint shall also be made. The joint shall then be finished off neatly outside the socket at an angle of 45 deg.

**Curing:**

The joint shall be cured for at least seven days. Refilling at joints will be permitted only on satisfactory completion of curing period.

**Cement Concrete for Pipe Supports:**

a. Unless otherwise directed by the UTITSL/Clients cement concrete for bed, all round or in haunches shall be as follows:

**upto 1.5 m depth**

**upto 3 m depth**

**beyond 3 m depth**

Stoneware pipes buried in open ground (no sub soil water) All round (1:3:6) In Haunches (1:3:6)

In Haunches (1:3:6) RCC or SW in sub soil water

All round (1:3:6)

In Haunches(1:3:6)

In Haunches(1:3:6)

PVC / HDPE pipe All round(1:2:4)

In Haunches(1:3:6)

In Haunches(1:3:6)

CI Pipes (in all conditions) All round(1:4:8)

In Haunches(1:4:8)

In Haunches(1:4:8)

All pipes under building All round(1:2:4)

All round(1:2:4)

All round(1:2:4)

b. Pipes may be supported on brick masonry or precast RCC or in situ cradles. Cradles shall be as shown on the drawings.

c. Pipes in loose soil or above ground shall be supported on brick or stone masonry pillars as shown on the drawings.

**Measurement:**

a. Excavation

Measurement for excavation of pipes trenches shall be made per linear meter.

b. Trenches shall be measurement between outside walls of manholes at top and the depth shall be the average depth between the two ends to the nearest cm. The rate quoted shall be for a depth upto 1.5 metre or as given in the Bill of Quantities. Payment for trenches more than 1.5 m in depth shall be made for extra depth as given in the Bill of Quantities and above the rate for depth upto 1.5 m.

c. RCC pipes shall be measured for length of the pipe line per linear meter.

i. Length between manholes shall be recorded from inside of one manhole or inside of other manhole.

ii. Length between gully trap and manhole shall be recorded between socket of pipe near gully trap and inside of manhole.

**C. PAINTING WITH ORDINARY OR SUPERIOR QUALITY READY MIXED PAINT.**

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Painting with ordinary or superior quality ready mixed paint on new work :

1. **Paint:** Ordinary quality or superior quality ready mixed paints shall be of approved brand and manufacture and of the required shades. They shall conform in all respects to the relevant I.S. specifications.

2. **Preparation of surface :**

(a) **Wood Work :** The surface shall be cleaned and all unevenness removed as in para knots if visible, shall be covered with a preparation of red lead as stated in earlier paragraph. Holes and indentations on the surfaces shall be filled in with glazier's putty or wood putty and rubbed smooth before painting is done. The surface should be thoroughly dry before painting.

b) **Iron and steel work :** The priming coat shall have dried up completely before painting is started. Rust and scaling shall be carefully removed by scraping or by brushing with steel wire brushes. All dust and dirt shall be carefully and thoroughly wiped away.

c) **Plastered Surface :** The priming coat shall have dried up completely before painting is started. All dust or dirt that has settled on the priming coat shall be thoroughly wiped away before painting is started.

**Application :** The specifications mentioned here-in-before shall hold good as far as applicable.

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

**Other details :** The specifications for "Painting (General)" shall hold good so far as they are applicable.

#### **D. PAINTING WITH SUPERIOR QUALITY FLAT OIL READY MIXED PAINT :**

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1. **Paint** : Ordinary quality or superior quality ready mixed paint shall be of approved brand and manufacture and of the required shades. They shall conform in all respects to the relevant I.S. specifications.
2. **Preparation of surfaces** : This shall be as for painting mentioned here-in-before or as the case may be.
3. **Wood work** : The surface shall be cleaned and all unevenness removed as mentioned here-in-before. Knots if visible, shall be covered with a preparation of red lead as mentioned before. Holes and indentations of the surface shall be filled in with glazier's putty or approved wood putty and rubbed smooth before painting is done. The surface should be thoroughly dry before painting.
4. **Iron and steel work** : The priming coat shall have dried up completely before painting is started. Rust and scaling shall be carefully removed by scrapping or by brushing with steel wire brushes. All dust and dirt shall be carefully and thoroughly wiped away.
5. **Plastered surface** : The priming coat shall have dried up completely before painting is started. All dust and dirt that has settled on the priming coat shall be carefully and thoroughly wiped away before painting is started.

**Application** : The specifications specified here-in-before shall hold good as far as possible.

The number of coats to be applied will be as stipulated in the item. The painted surface shall present a uniform appearance and glossy/semi glossy finish, as the case may be and free from streaks, blisters etc.

**Other Details** : The specifications for "Painting (General)" as mentioned before shall hold good in so far as they are applicable.

**E. PAINTING WITH SYNTHETIC ENAMEL PAINT/SEMI GLOSS PAINTING WITH SYNTHETIC ENAMEL PAINT ON NEW WORK**

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- 1 **Paint :** Synthetic enamel/semi gloss paint of approved brand and manufacture and the required shade shall be used for the top coat and an undercoat of shade to match the top coat as recommended by the manufacturer shall be used.
- 2 **Preparation of surface :** This shall be as for painting with ordinary or superior quality ready mixed paint as mentioned here-in-before as the case may be.
- 3 **Application :** The number of coats including the under coat shall be as stipulated in the item.
- 4 **Under Coat :** One coat of the specified paint of shade suited to the shade of the top coat shall be applied and allowed to dry overnight. It shall be rubbed next day with the finest grade of wet abrasive paper to ensure a smooth and even surface free from brush marks and all loose particles dusted off. All the cracks, crevices, roughness etc. will be filled with approved putty as per manufacturer's recommendations.
- 5 **Top Coat :** Finishing coats of specified paint of the desired shade shall be applied after the under coat is thoroughly dry. Additional finishing coats shall be applied if found necessary to ensure a properly uniform semi glossy surface.

**Other Details :** The specifications for Painting (General) mentioned here-in before shall hold good as far as they are applicable.

## F **PAINING WITH ACRYLIC EMULSION PAINT/PLASTIC EMULSION PAINT**

This shall be polyvinyl-based Acrylic emulsion paint manufactured by one of the reputed paint manufacturers and dispatched to the site in sealed containers.

1. **Primer :** A primer to be used for the painting with acrylic emulsion on cement concrete and plaster and plastered surfaces, A.C. sheets as also timber and metal surfaces (if necessary) shall be of approved base and as per recommendations of the manufacturers.

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2. **Putty** : Plaster filler to be used for filling up (puttying) uneven surfaces, small cracks and holes etc. shall be of approved compound and as per recommendations of the manufacturers. No oil-based putty shall be used. The putty should be made from a mixture of whiting and plastic emulsion paint or as per manufacturer's recommendations.
3. **Finishing Coats** : All the finishing coats shall be of mat finish or any other finish as required by the Engineer-in-charge. Number of finishing coats shall be as specified in the item.

**G: MODE OF MEASUREMENTS :**

All the measurements for payment shall be taken on net surface areas actually painted, unless otherwise specified. Deduction will be made from the areas for fixtures, grills, ventilation outlets, electrical boxes and such obstruction not painted, if they are individually more than 0.05 Sq.mtr.

**H: JOB REQUIREMENTS :**

Note :

1) **PAINTING OF PLASTERED SURFACE.**

Acrylic emulsion paint is required to be provided on plastered and concrete surfaces in portions of the building. It may please be noted that UTIITSL shall reserve the option to delete or increase quantities in full or part from the scope of contract during progress of work.

All wood surfaces are to be painted with semi glossy synthetic enamel paint with an approved primer. Primer of zinc chromate primer.

Zinc chromate primer supersedes wood primer mentioned earlier in the specifications.

All colours of paints shall be subjected to review and prior approval of Engineer-in-charge shall be taken before the application.

2) **WHITE WASHING WITH LIME.**

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**Scaffolding :** Wherever scaffolding is necessary, it shall be erected on double supports tied together by horizontal pieces, over which scaffolding planks shall be fixed. No ballies, bamboos or planks shall rest on or through the surface which is being white washed.

Where ladders are used, pieces of old gunny bags shall be tied on their tops to avoid damage or scratches to walls.

For white washing the ceiling, proper stage scaffolding shall be erected.

**Preparation of surface :** Before new work is white washed the surface shall be thoroughly brushed free from mortar dropping and foreign matter.

In the case of old work, all loose pieces and scales shall be scrapped off and holes in plaster as well as patches of less than 50 sq.m. area shall be filled up with mortar of the same mix. Where so specifically ordered by the Engineer-in-charge, the entire surface of old white wash shall be thoroughly removed by scrapping and this shall be paid for separately.

**Preparation of lime wash :** The wash shall be prepared from fresh stone white limeöKatani or equivalentö. The lime shall be thoroughly slaked on the spot, mixed and stirred with sufficient water to make a thin cream. This shall be allowed to stand for period of 24 hrs. and then shall be screened through a clean coarse cloth. 40 gm. of gum dissolved in hot water, shall be added to each 10 cubic decimetre of the cream. The approximate quantity of water to be added in making the cream will be 5 litres of water to one kg. of lime.

Indigo (Neel) up to 3 gm per kg of lime dissolved in water, shall then be added and wash stirred well. Water shall then be added at the rate of about 5 litre per kg. of lime to produce a milky solution.

Lime obtained as a by-product in the manufacture of acetylene may also be used for white washing purposes instead of white lime of katani quality. When such lime is used it shall be ensured that it is procured fresh in the form of a paste and used before it dries up. The lime shall be mixed with sufficient water to make it thin cream. The cream shall be screened through a clean

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coarse cloth and 40 gm. Gum dissolved in hot water added for each 10 cubic decimetre of the cream. More water shall be added at the rate of 5 litres per kg. of lime to produce a milky solution. When by product lime is used it is not necessary to add indigo (neel).

**White Washing :** The white wash shall be applied with brushes or by spray in the specified number of coats. The operation for each coat in case of brush application shall consist of a stroke of the brush given from the top down wards, another from the bottom upwards over the first stroke, and similarly one stroke horizontally from the right and another from the left before it dries.

Each coat shall be allowed to dry before the next one is applied. Further each coat shall be inspected and approved by the Engineer-in-charge before the subsequent coat is applied. No portion of the surface shall be left out initially to be patched up later on.

For new work, three or more coats shall be applied till the surface present a smooth and uniform finish through which the plaster does not show. The finished dry surface shall not show any signs of cracking and peeling nor shall it come off readily on the hand when rubbed.

For old work, after the surface has been prepared as described here in before a coat of white wash shall be applied over the patches and repairs. Then a single coat or two or more coats of white wash as stipulated in the description of the item shall be applied over the entire surface. The white washed surface should present a uniform finish through which the plaster patched do not appear.

**Protective Measure :** Door windows, floors, articles of furniture etc. and such other parts of the building not to be white washed shall be protected from being splashed upon. Splashings and droppings, if any, shall be removed by the contractor at his own cost and the surfaces cleaned. Damages if any to painted surfaces, furnitures, or fittings and fixtures etc. shall be recoverable from the contractor.

**Measurements :** White washing shall be measured in sq.m. length and breadth shall be measured correct to a cm.. All measurements for payment shall be taken on neat surface areas actually white

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washed, unless otherwise specified. Deduction will be made from the areas for fixtures, grills, ventilation outlets electrical boxes and such obstruction not painted if they are individually more than 0.05 Sq.m. Length and breadth shall be taken correct upto two places of decimal of a metre and areas so worked out shall be correct upto two places of decimals of a Sq.metre.

Corrugated surfaces shall be measured flat as fixed and the area so measured shall be increased by the following percentages to allow for the girthed area.

Corrugated asbestos cement sheets                      20%

Semi-corrugated asbestos cement sheets              10%

The number of coats of each treatment shall be stated. The item shall include removing nails, making good holes, cracks, patches etc. not exceeding 0.1 Sq.m. each with materials similar in composition to the surface to be prepared.

**Rate :**The rate shall include the cost of all materials and labour involved in all the operations described above, i.e. all inclusive.

**Colour Washing :**In the case of colour washing materials colours, not affected by lime, shall be added to white wash with proper glue. No colour wash shall be done until a sample of the colour wash to the required tint or shade has been got approved from the Engineer-in-charge. The colour shall be of even tint or shade over the whole surface. If it is patchy or otherwise badly applied, it shall be redone by the contractor, at no extra cost to UTIITSL.

For new work, the priming coat shall be of white wash lime or with whiting as specified in the description of the item. Three coats, shall then be applied on the entire surface till it represents a smooth and uniform finish. Each coat after applying shall be got approved from the Engineer-in-charge.

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Other specifications as detailed for White washing with lime shall be applicable. Indigo (neel) shall however, not be added.

### **Dry Distempering :**

**Distemper :** Dry distemper of approved brand/manufacture and colour and required shade shall be used. The dry distemper shall be stirred slowly in clean water using 0.6 litres of water per kg. of distemper or as specified by manufacturers. Warm water shall preferably be used. It shall be allowed to stand for at least 30 minutes before use. The mixture shall be invariably well stirred before and during use to maintain an even consistency.

**Preparation of surface :** This shall be as for painting mentioned here-in-before or as the case may be.

**Application :** In case of new work, the treatment shall consist of a priming coat followed by the application of two or more coats of distemper till the surface shows an even colour.

**Priming coat :** Priming coat of whiting shall be applied over the prepared surfaces. Priming coat shall be applied with whiting which shall be dissolved in sufficient quantity of warm water and thoroughly stirred to form a thin slurry which shall then be screened through a clean coarse cloth. Two kg. of gum and 0.4 kg. of copper sulphate dissolved separately in hot water shall be added for every cu.m. of the slurry which shall then be diluted with water to the consistency of milk so as to make wash ready for use. No white washing coat shall be used as a priming coat for distemper.

The application of each coat shall be as mentioned in the specifications for painting (General) mentioned here-in-before shall hold good and as far as they are applicable.

**Oil Bound Distemper :**a) Oil bound distemper of approved brand/manufacture and colour and required shade shall be used. The primer where used as on new work shall be cement primer or distemper primer as specified in the item. These shall be of the same manufacture as oil bound distemper.

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**Preparation of surfaces** : Priming coat with cement primer or distemper primer shall only be applied.

**Application** : The cement primer or distemper primer shall be applied by brushing and not by spraying. Hurried priming of shall avoided. Particularly on absorbent surfaces. New plaster patches in old work before applying oil bound distemper shall be treated with cement primer/distemper primer. The surfaces shall be finished as uniformly as possible leaving no brush marks. It shall be allowed to dry for at least 48 hours before oil bound distemper is applied. Before applying distemper the surface shall be lightly sand papered to make it smooth for receiving the oil bound distemper, taking care not to rub out the priming cost. A time interval of at least 24 hours shall be allowed between consecutive coats to permit the proper drying of the preceeding coat. Two or more coats of distempers as are found necessary shall be applied over the priming coat to obtain an even shade.

**Other Details** : The specifications for öPainting (General)ö mentioned here-in-before shall hold good as far as they are applicable.

**Waterproofing Cement Paint :**

**Cement Based Paint** : Cement based paints of approved manufacture, quality, shade and colour only shall be used.

**Preparation of surface** : The surface shall be thoroughly cleaned all mortar dropping, dirt, dust, algae, grease and other foreign matter by brushing and washing the surface shall be thoroughly wetted with clean water before the water proof cement paint is applied.

Water proof cement shall be mixed in such quantities as can be used up with in an hour of its mixing or otherwise the mixture will set and thicken affecting flow and finish. Water proof cement paint shall be mixed with water in two stages.

The first stage shall comprise of 2 parts of water proof cement paint and one part of water stirred thoroughly and allowed to stand for 5 minutes. Care shall be taken to add the water proof cement paint gradually to the water and not vice versa. The second stage shall comprise of adding further

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the part of water to the mix and stirring thoroughly to obtain liquid of workable and uniform consistency. In all cases manufacturer's instructions shall be followed meticulously.

**Application :**The solution shall be applied on the clean and wetted surface with brushed or spraying machine. The solution shall be kept well stirred during the period of application. To avoid direct heat of the sun, during painting the cement based paint shall be applied on the surface which is on the shady side. Cement based paints shall not be applied on the surfaces already treated with white wash, colour wash, distemper dry or oil bound etc.

**Other Details :**The specifications for "Painting (General)" mentioned here-in-before shall hold good as far as they are applicable.

**Bees Waxing or Polishing with Ready made Wax Polish :**

- 1) Bees waxing or polishing with ready made wax polish on new work :

**Materials :**The polishing shall be done with bees waxing prepared locally or with ready made wax polish of approved brand and manufacture, as stipulated in the description of item.

Where bees waxing is to be prepared locally, the following specifications for the same shall apply

Pure bees wax free from paraffin or stearine adulterants shall be used. Its specific gravity shall be 0.965 to 0.969 and melting point shall be 63 °C.

The polish shall be prepared from a mixture of bees wax, linseed oil, turpentine and varnish in the ration of 2:1 1/2:1 1/2 by weight.

The bees wax and boiled linseed oil shall be heated over a slow fire. When the wax is completely dissolved the mixture shall be cooled till it is just warm and turpentine and varnish added to it in the required proportions and the entire mixture shall be well stirred.

- 2) **Preparation of surface :** Preparation of surface will be as mentioned here-in-under 1:13:b with the exception that knotting, holes and cracks shall be stopped with a mixture of fine saw dust formed of the wood being treated, beaten up with sufficient bees wax to give to cohesion.

- 3) **Application :** The polish shall be applied evenly with a clean soft pad of cotton cloth in such a way that the surface is completely and fully covered. The surface is then rubbed continuously for half an hour.

When the surface is quite dry, a second coat shall be applied in the same manner and rubbed continuously for one hour or until the surface is dry.

The final coat shall then be applied and rubbed for two hours (more if necessary) until the surface has assumed a uniform gloss and is dry, showing no sign of stickiness.

The final polish depends largely on the amount of rubbing which should be continuous and with uniform pressure, with frequent changes in the direction.



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- 4) **Other Details :** The specifications for Painting (General) as mentioned here-in-before shall hold good as far as they are applicable.

1.13 **French Spirit Polishing :**

French spirit polishing including a coat of wood filler on new work:

- 1) **Polish :** Pure shellac varying from pale orange to lemon yellow colour, free from resin or dirt shall be dissolved in methylated spirit at the rate of 150 gm of shellac to 1 litre of spirit. Suitable pigment shall be added to get the required shade.
- 2) **Preparation of surface :** The surface shall be cleaned. All unevenness shall be rubbed down smooth with sand paper and well dusted. Knots if visible shall be covered with a preparation of red lead and glue size laid on, while hot. Holes and indentations on the surface shall be stopped with glazier's putty. The surface shall then be given a coat of wood filler made by mixing whiting (ground chalk) in methylated spirit at the rate of 1.5 kg. of whiting per litre of spirit. The surface shall again be rubbed down perfectly smooth with glass paper and wiped clean.
- 3) **Application :** The number of coats of polish to be applied shall be as described in the item.  
  
A pad woolen cloth covered by a fine cloth shall be used to apply the polish. The pad shall be moistened with the polish and rubbed hard on the wood, in a series of overlapping circles applying the mixture sparingly but uniformly over the entire area to give an even level surface. A trace of linseed oil on the face of the pad facilitates this operation. The surface shall be allowed to dry and the remaining coats applied in the same way. To finish off, the pad shall be covered with a fresh piece of clean fine cotton cloth, slightly damped with methylated spirit and rubbed lightly and quickly with circular motions. The finished surface shall have a uniform texture and high gloss.
- 4) **Measurements, Rate and other details :** These shall be as for Painting (General) mentioned here-in-before as far as they are applicable.

**I : ANTI-TERMITE TREATMENT :**

The anti-termite treatment should be carried out as per BIS 6313 (part II) 1971 or relevant latest revision and should be carried out through a member of Indian Pest Control Association having sufficient experience for carrying out similar job of magnitude proposed.

**J: CEMENT :**

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The cement proposed to be used to be ordinary Portland Pezzolena cement confirming to BIS269 1976 manufactured by an Indian manufacturing Company such as ULTRATECH, ACC, Gujarat Ambuja or equivalent. The cement should be stored strictly as per the BIS specification.

**K: WATER :**

The water to be used should be portable water free from injurious amount of oil, acid, alkalies, salt, sugar organic materials or any other substances that may be deleterious to concrete or steel. The recommended chemical ingredients should not be more than the relevant BIS specification (3025-1964).

**L: BRICK WORK :**

Scope of work : The work covered under this specification pertains to procurement of best quality locally available bricks and workmanship in building walls of various thickness, in strict compliance with the applicable specifications and applicable drawings.

Materials : Bricks shall be best quality locally available brick and should be approved by the Engineer-in-charge before incorporation in the work. Brick shall generally conform to I.S.1077-1957. In any case minimum-crushing strength shall not be less than 35 kg/cm<sup>2</sup> and water absorption shall not be more than 25%. The Engineer-in-charge shall have the right to reject bricks obtained from any field where the soil does not have an appreciable quantity of sulphates and chlorides. The specifications for cement, sand and water shall be same as laid out in BIS codes hereinafter. Bricks shall be thoroughly soaked in water before using till the bubbles cease to come up. No half or quarter brick shall be used except as closers. The closers shall be horizontal and the walls shall be raised to plumb. The type of bond to be adopted will be decided by the Engineer-in-charge, but vertical joints shall be laid staggered.

Bricks to be laid with the "Frogs up side".

Workmanship : Four courses of brick work with four joints should not exceed by more than 40 mm the same bricks piled one over the other without mortar.

Brick work shall not be raised more than 10 courses a day unless otherwise approved by the Engineer-in-charge. The brick work shall be kept wet for at least 7 days. Brick work shall be uniformly raised all round and no part shall be raised more than 1.0 metre above another at any time.

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All joints shall be thoroughly flushed with mortar of mix as specified in the schedule of quantities, at every course. Care shall be taken to see that the bricks are bedded effectively and all joints completely filled to the full depth.

The joints of brick work to be plastered shall be raked out to a depth not less than 10 mm as the work proceeds. The surface of brick work shall be cleaned down and watered properly before the mortar sets.

No brick work shall be carried on during frosty weather except with the written permission of the Engineer-in-charge, who will give special direction as to the manner in which the work is to be performed. All brick work laid during the day, shall in seasons liable to frost, be properly covered up at night as directed by the Engineer-in-charge. Should any brickwork be damaged by frost the brick work shall, at the discretion of the Engineer-in-charge, be pulled down and made good, at the cost of the contractor.

Brick work shall be well watered three times a day for a week from the date of building and the work shall be protected from sun and rain.

Materials and workmanship for a half brick or brick on edge portion wall shall be as specified above. The wall shall be stiffened by R.C.C. stiffeners of size 115mm wide x 80 mm thickness to the full length of wall and shall be provided with 2 Nos. 6mm  $\Phi$  M.S. bars as bottom reinforcement (only the M.S. reinforcement will be paid separately under relevant item).

The rates for brickwork shall include the cost of the following :-

Providing and fixing necessary single or double scaffolding and removing the same after the work is completed.

- i) Watering, curing, lifting of materials to any height.
- ii) Raking out of joints to receive plaster.
- iii) Forming slab seatings, cutting or leaving holes for lugs of windows, doors, sills, switch and plug boxes etc.

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- iv) Making good all holes, chases, etc. to any depths due to conduit pipes, holdfasts, bolts, switch and plug boxes etc.
- v) Bedding and pointing precast lintels, sills, etc. in or on walls.

For purposes of measurements the thickness of one brick wall and over shall be taken in terms of multiples of half brick, or as stipulated in BOQ/herein below.

**Mode of measurements :**

- a) For brick work measured in cubic metres : The contract rate shall be for a unit of one cubic metre of brick masonry as actually done. 230 mm brick walls shall be taken as one brick thick. All openings in brick work for doors and windows and ventilators shall be deducted to get the net quantity of actual brick work done. Openings or chases required for PH or electrical insert less than 0.1 sq.mtr. and bearing of precast concrete members shall not be deducted. No separate payment shall be made for any extra work involved in making the above openings.
- b) For brick work measured in Sq. metres : Half brick thick masonry walls shall be measured sq. metres. All openings in brick work for doors and windows and ventilators shall be deducted to get the net quantity of actual brick work done. Openings or chases required for PH or Electric inserts less than 0.1 sq. mtr. and bearings of precast concrete members shall not be deducted. No separate payment shall be made for extra work involved in making the above openings or placement.

**M: CONCRETE :**

Strictly confirming to BIS 456 ó 2000 for materials and workmanship.

**NOTE :** This specification is of the general type only and must be used in conjunction with the drawing of the particular item being made. Anything shown on the drawing and not in the specification must be compiled with, and vice versa and clarification on this should be sought from. The Engineer-in-Charge to remove doubts if any.

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**N: POLYMER MODIFIED CEMENT MORTAR TREATMENT FOR R.C.C. MEMBERS:**

- Open the damaged portion of the R.C.C. slab, beam, column etc. and remove all the **loose concrete**, plastering etc. Clean the surface thoroughly with air blower followed by water jet. Expose the rusted reinforcement.
- Clean the rusted reinforcement thoroughly with wire brush and remove all the scales.
- Apply RUSTICIDE (or equivalent approved by the Engineer-in-Charge) to the reinforcement by a cotton swab. Allow to remain for 24 hours and then brush off any loose particles by dry paint brush.
- Apply two Protective coats made out of POLYALK FIXOPRIME or equivalent approved by the Engineer-in-Charge : CEMENT (1:1.5 by weight ) to the concrete by brush.
- Apply a bond coat of POLYALK EP or equivalent approved by the Engineer-in-Charge: CEMENT (1:1) by weight to the surface.
- Place polymer mortar by mixing:
  - 1 kg Polyalk EP
  - 5 kg Cement
  - 15 kg Quartz sand (10 kg passing 2mm and 5kg passing 1.5mm)
  - Water: 1 to 1.5 litres depending upon the consistency required.
- Place in thickness of 10-15 mm for one layer. Allow layer to set initially before applying next layer.
- In case the required thickness is more than 15mm, the mortar should be applied in 2 or more coats at an interval of 8 hours after application of bonding coat of POLYALK EP:CEMENT (1:1 by weight ) by brush.
- Finish surface with trowel.
- Place polymer mortar as above depending on the thickness.
- Allow to air cure for 48 hours followed by water sprinkling for 3 days or curing by wet squeezed gunny bags.

**NOTES**

Cement : 53 grade

Sand : Quartz sand.

Mode of measurement: in sq. mtrs depending on the thickness (25mm 50mm).

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## RECTIFICATION IN WATER TANK

The loose/Rusted Valves and Pipes should be removed care fully from the RCC Structres without damaging the other member of the structure for 230 mm dia with hacked/slotted finish wth ZigZag.

Apply the bonding agent using Multi purpose binder (MPB) coating for the bonding membrane coat between the old concrete to the New concrete

Place the puddle flanged pipe with relavent dia in proper level,line ,position and verticality.

Packwith 1:1:2 mix concrete (1 part cement,1 part sand and 2 parts of 6mm BG Metal)mixed with water proofing compound (URP).

Allow it for proper continuous curing providing with Asine cloth or by applying curing compound .

## CORE CUTTING IN RCC SLAB

Corecutting Macine should be used for making of hole 75 mm dia to run the 50 mm dia watermain below the terrace.The hole tobe packed with screed concrete using 1:1:2 mix added with water proofing compound(URP) and to be finished with required coping around the pipe.The water main tobe suppoted with brickwork for a height of 400 mm above the floor level.

## RINGMAIN AT TERRACE

This work tobe carried out at Terrace connected with all water mains in one plane area .Ring main should run alongwith the paparapet wall to a height of 400 mm from the floor level .This pipe should be supported with Brick pillars constructed at an interval of 3m .If the line is not possible to bring through the shaft at terrace,these lines may run near to the respective duct externally upto 8<sup>th</sup>/7<sup>th</sup> floor and same has tobe connected inside the shaft at 8<sup>th</sup>/7<sup>th</sup> floor.

**O: CEMENT GROUTING FOR R.C.C. MEMBERS**

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- Drill holes atleast 12 mm in diameter inside the concrete surface. In case of columns of 9ö thickness the holes should be atleast 4ö in depth.
- Insert P.V.C.nozzles in the holes and fix the nozzles using POLYPLUG for immediate fixing.

Grouting shall be done with a grout pump at a pressure of 2 kg/cm<sup>2</sup> with the following proportions:

Cement : 1 kg.

Monobond : 200 ml.

Water : 6 litres.

Microsilica : 200gms.

Entosh : 200 ml.

The holes which are made should be then sealed with polymer mortar.

**P. EXTERNAL PLASTER :**

- Providing and applying water proof plaster 25mm thick, 1:4 for the 1<sup>st</sup> coat and 1:3 for the 2<sup>nd</sup> coat mixed with liquid integral water proofing compound in proportion of 100 ml of supercon or equivalent approved by Engineer-in-Charge 100 with 50 kg of cement.
- Before carrying out the plastering work the joint shall be racked, pointed with the cement mortar 1:4.
- The bonding coat made out of POLYALK EP: CEMENT (1:1. 25 by weight) should be applied to damp surface by brush. Care should be taken to prepare so much slurry, which can be used within 30 minutes.
- The base coat 12 ö 18 mm thick to be made out of river sand (single screened passing through 5 mm) mixed with 100 ml supercon 100 for a bag of cement finished rough (roughened with wire brushes or by scratching diagonal lines 1.5 mm deep at 75 mm. centre both ways as directed)
- The finishing coat 8-12 mm thick to be made out of river sand and cement in proportion of 1:3 (double screened sand passing through 3 mm sieve) mixed with 100 ml supercon 100 for a bag of cement finished in smooth / rough / Sand face in line, level and in plumb.
- All complete including surface preparations scaffolding, curing, etc as per standard specification and as per directed by the Engineer in-Charge.

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- Curing shall be done thoroughly for atleast 7 days.

#### **NOTES:**

Cement : 43 grade

Sand : Washed River sand

Mode of measurement: per sq.mtr.

#### **MACHINE MIXING FOR MORTAR**

All Sand to be washed

#### **INTERNAL PLASTER**

- Providing and applying plaster 12 mm thick, 1:4 mixed with liquid integral water proofing compound in proportion of 100 ml of supercon 100 with 50 kg of cement. Before carrying out the plastering work the joint shall be racked, pointed with the cement mortar 1:4.
- The bonding coat made out of POLYALK EP or equivalent as approved by the Engineer-in-Charge: CEMENT (1:1. 25 by weight) should be applied to damp surface by brush. Care should be taken to prepare so much slurry, which can be used within 30 minutes.
- The plaster shall be in proper line, plumb level etc.All complete including surface preparations scaffolding, curing, etc as per standard specification and as per directed by the Engineer in-Charge. Curing shall be done thoroughly for atleast 7 days.

#### **NOTES:**

Cement: 43 grades

Sand : River sand thoroughly washed

Mode of measurement: per sq.mtr.

#### **MACHINE MIXING FOR MORTAR**

**(THE ABOVE ARE THE GENERAL SPECIFICATION SHOULD BE READ IN CONJUNCTION WITH BILL OF QUANTITIES. THE BILL OF QUANTITIES MAY BE TAKEN AS THE BASIS FOR THE WORK TO BE EXECUTED. IN CASE OF ANY DISCREPANCY IN THE SPECIFICATION AND THE BILL OF QUANTITIES, THE BILL OF QUANTITIES MAY BE TAKEN AS FINAL IN CASE THE CONTRACTOR SHOULD CHECK UP WITH THE ENGINEER IN CHARGE WHO'S DECISION WILL BE FINAL.)**

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# **UTI Infrastructure Technology And Services Ltd.**

## **SUMMARY**

**Note:** Rates should be inclusive of all the taxes i.e. Sales Tax, Excise Duty, Royalty, Octroi, Works Contract Tax, or any other statutory liabilities, taxes, VAT, duties i.e. the rate should be all inclusive, but exclusive of Service Tax

The rates should inclusive of installation and commissioning of the work and free delivery of the material at the site

<b>PART</b>	<b>DESCRIPTION</b>	<b>AMOUNT IN FIGURES</b>
<b>A</b>	<b>Plumbing work</b>	
	<b>GRAND TOTAL</b>	<b>Rs</b>
	<b>Rupees</b>	
	(..... )	

Contractor's Signature

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## UTI INFRASTRUCTURE TECHNOLOGY AND SERVICES LTD., Delhi

### **BILL OF QUANTITIES:**

#### **Note :**

1. Rates to be quoted by the tenderers in the item rate tender in figures and words shall be accurately filled in, so that there is no discrepancy in the rates written in figure and in words. However, if a discrepancy is found between the rate written in figures and rate written in words then the rate which correspond with the amount worked out by the contractor shall be taken as correct.
2. If the amount of an item is not worked out by the tendered, or it does not correspond with the rate written either figures or in words, then the rate quoted by the tenderer in words shall be taken as correct.
3. Where the rate quoted by the tenderer in figures and in words tally but the amount is not worked out correctly, the rate quoted by the contractor will be taken as correct, not the amount.
4. Contractor need to take care while working for the entire furnitures & other asset belongs to Punjab & Sind Bank to avoid damages and falling of unwanted materials or debris.

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Sl. No.	Description	Unit	Qty	Rate	Amount
1	<b><u>DISMANTLING :</u></b>  Breaking the existing brick / concrete/ siporex wall, floor tiles, wall tiles, floor, removing the doors with door frames, windows, grills, and all sanitary, drainage and all pipes etc. and taking away the useful materials such as door etc. without disturbing the structure. Setting right the surfaces by plastering, punning etc. to original condition all complete including carting away the debris to a place approved by Municipal Corporation / Local Authorities. a) Brick work 230 mm including plaster b) windows with grills c) doors with frames d) Brick work 115 mm with plaster and tiles e) RCC water tank (size of 16ø x 12ø x 7ø) f) PVC/CI/GI/CRC PIPE (any Sizes) g) Sewage pipe at basement (any sizes) with clamps h) Manhole with cover and gully chamber with cover ( any Sizes) i) Flooring tiles including sub base as required				
a	Approximate Quantity	Cum.	02		
b	Approximate Quantity	Sqmt.	05		
c	Approximate Quantity	Sqmt.	05		
d	Approximate Quantity	Sqmt	50		
e	Approximate Quantity	1 job	1		
f	Approximate Quantity	Rmt.	40		
g	Approximate Quantity	RMT	60		
h	Approximate quantity	Nos	05		
i	Flooring Tiles including sub base as required	Sqmt	5		
Mode of measurements: Length to the nearest Cm. Unit : Running Metre  a ) (Rupeesí .....í í í .....only per Cubic Mt)					

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b)	(Rupeesí .....í í í .....only per SqM)				
c)	(Rupeesí .....í í í .....only per SqM)				
d)	(Rupeesí .....í í í .....only per SqM)				
e)	(Rupeesí .....í í í .....only each job				
f)	(Rupeesí .....í í í .....only per RM)				
g)	Rupeesí .....í í í .....only per RM)				
h)	( Rupees í ..only each)				
i)	(Rupees í only per sqmt).				
2.	<p><b><u>WATER SUPPLY</u></b></p> <p>This item includes providing and fixing necessary scaffolding up to the required height and providing &amp; fixing suitable saddle and clamps as per the site requirement.</p> <p>Providing and fixing -CØ class GI pipes on the external walls and shafts, of <b>Tata</b> and GI fittings of -RØ brand such as tees, bends, elbows, reducers, unions, nipples etc. including cutting, threading the pipes, fixing with required GI pipes. Laying of pipes in any type of soil or under floor or fixing on Building external/ parapet walls, ducts, or laying on the terrace on pedestals (Including providing concrete/brick pedestals as required) as directed by the Engineer-in-charge, providing and Fixing clamps and supports wherever necessary, including chasing in walls, floors and restoring damaged portion to original condition, applying 2 coats of synthetic enamel paint for the exposed surfaces over a coat of primer of approved quality. Testing the pipes and fittings to hydraulic test pressure to 7 kg. / sq. cm. etc. complete. G.I. fittings shall be -RØ brand only. Wherever the pipes are to be laid under floor or concealed in walls the pipes shall be coated with bitumen wrapped with Hessian cloth and again painted with one coat of anticorrosive bitumen of approved quality as per specification and the rate shall include for the</p>				

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	same.  A) 15 mm dia nominal bore B) 20 mm dia nominal bore C) 25 mm dia nominal bore D) 32 mm dia nominal bore E) 40 mm dia nominal bore F) 50 mm dia nominal bore G) 65 mm dia nominal bore H) 80 mm dia nominal bore				
<b>A</b>	<b>Approximate Quantity</b>	<b>RMT</b>	<b>20.00</b>		
<b>B</b>	<b>Approximate Quantity</b>	<b>RMT</b>	<b>30.00</b>		
<b>C</b>	<b>Approximate Quantity</b>	<b>RMT</b>	<b>20.00</b>		
<b>D</b>	<b>Approximate Quantity</b>	<b>RMT</b>	<b>10.00</b>		
<b>E</b>	<b>Approximate Quantity</b>	<b>RMT</b>	<b>20.00</b>		
<b>F</b>	<b>Approximate Quantity</b>	<b>RMT</b>	<b>30.00</b>		
<b>G</b>	<b>Approximate Quantity</b>	<b>RMT</b>	<b>60.00</b>		
<b>H</b>	<b>Approximate Quantity</b>	<b>RMT</b>	<b>40.00</b>		
<p>Mode of measurements: Length to the nearest Cm. Unit : Running Metre</p> <p>A ) (Rupeesí .....í í í .....only per RM)</p> <p>B) (Rupeesí .....í í í .....only per RM)</p> <p>C) (Rupeesí .....í í í .....only per RM)</p> <p>D) (Rupeesí .....í í í .....only per RM)</p> <p>E) (Rupeesí .....í í í .....only per RM)</p> <p>F) (Rupeesí .....í í í .....only per RM)</p> <p>G) (Rupeesí .....í í í .....only per RM)</p> <p>H) (Rupeesí .....í í í .....only per RM)</p>					
<b>3.</b>	<p><b><u>GATE VALVE :</u></b></p> <p>Providing and fixing gate valve confirming to relevant BIS specifications of M/s. Leader brand . <b>The item includes dismantling of existing Gate Valve and store the dismantled material as per direction of the client/Engineer in Charge.</b></p>				

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	a) 20 mm dia b) 25 mm dia c) 32 mm dia d) 40 mm dia e) 50 mm dia f) 65 mm dia g) 80 mm dia				
<b>a</b>	<b>Approximate Quantity</b>	<b>EACH</b>	<b>12.00</b>		
<b>b</b>	<b>Approximate Quantity</b>	<b>EACH</b>	<b>12.00</b>		
<b>c</b>	<b>Approximate Quantity</b>	<b>EACH</b>	<b>12.00</b>		
<b>d</b>	<b>Approximate Quantity</b>	<b>EACH</b>	<b>12.00</b>		
<b>e</b>	<b>Approximate Quantity</b>	<b>EACH</b>	<b>4.00</b>		
<b>f</b>	<b>Approximate Quantity</b>	<b>EACH</b>	<b>8.00</b>		
<b>g</b>	<b>Approximate Quantity</b>	<b>EACH</b>	<b>4.00</b>		
Mode of measurements: Count Unit : Nos.  <b>a )</b> (Rupeesí .....í í í .....only Nos)  <b>b</b> (Rupeesí .....í í í .....only Nos)  <b>c</b> (Rupeesí .....í í í .....only Nos)  <b>d</b> (Rupeesí .....í í í .....only Nos)  <b>e</b> (Rupeesí .....í í í .....only Nos)  <b>f</b> (Rupeesí .....í í í .....only Nos)  <b>g</b> (Rupeesí .....í í í .....only Nos)					
<b>4.</b>	<b><u>PVC – WASTE, VENT AND SOIL PIPELINE ON THE EXTERNAL / INTERNAL WALL AND DUCT-INCLUDING RAIN WATER PIPE</u></b>  This item includes providing and fixing necessary scaffolding up to the required height.  Supplying and fixing approved quality of rigid PVC pipes of TRIBORE / PRINCE / SUPREME make jointing the pipe and fittings such as T , Elbow ,Double T , and T with service cover and all as per the site requirements with suitable solvent as per manufacturers specifications, laying on wall as desired by the				

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	<p>client or its authorized representative including providing necessary support, clamp, scaffolding etc. conveying the materials to all floors making holes in masonry or concrete cutting the pipes to required length, testing to a head of 1.8 m for horizontal pipes and for vertical pipes by filling with water etc. complete all as per specifications drawings etc. complete.</p> <p>a) 50 mm dia 6 kg / sq. cm. class b) 63 mm dia 6 kg / sq. cm. class c) 75 mm dia 6 kg/ sq.cm. class d) 100 mm dia 6 kg/ sq.cm. class e ) 150 mm dia 6 kg/ sq cm. class</p> <p>This item includes providing of vent/cowl at top for air release.</p>				
a	<b>Approximate quantity</b>	<b>RMT</b>	<b>40.00</b>		
b	<b>Approximate quantity</b>	<b>RMT</b>	<b>40.00</b>		
c	<b>Approximate quantity</b>	<b>RMT</b>	<b>40.00</b>		
d	<b>Approximate quantity</b>	<b>RMT</b>	<b>150.00</b>		
e	<b>Approximate quantity</b>	<b>RMT</b>	<b>40.00</b>		
<p>Mode of measurements: Length to the nearest Cm. Unit : Running Metre</p> <p>a ) (Rupeesí .....í í í .....only per RM)</p> <p>b (Rupeesí .....í í í .....only per RM)</p> <p>c (Rupeesí .....í í í .....only per RM)</p> <p>d (Rupeesí .....í í í .....only per RM)</p> <p>e (Rupeesí .....í í í .....only per RM)</p>					
5.	<p><b><u>PRESSURE REDUCING VALVE :</u></b></p> <p>Providing and fixing pressure reducing valve of ISI make with necessary fixture and fittings the pressure reduce valve need to be fixed on the top floor of the terrace or in the shaft all as per the manufacturer detail and specification</p> <p>a)64 to 50 mm dia b)50 to 38 mm dia</p>				

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	c)38 to 15 mm dia				
a	<b>Approximate Quantity</b>	<b>Nos</b>	<b>10</b>		
b	<b>Approximate Quantity</b>	<b>Nos</b>	<b>10</b>		
c	<b>Approximate Quantity</b>	<b>Nos</b>	<b>10</b>		

Mode of measurements: Count

Unit : Nos.

a ) (Rupeesí .....í í í .....only Nos)

b ) (Rupeesí .....í í í .....only Nos)

c ) (Rupeesí .....í í í .....only Nos)

6.	<b><u>BRICKWORK 115MM THICK:</u></b>  Brickwork for super structure 115 mm. thick made out of well burnt bricks confirming to BIS 1077 1986 specification in cement mortar 1:4 in any location / floor. All materials such as brick, cement, fine aggregate, water etc., should confirm to relevant BIS specification and the workmanship should also confirm to the relevant specification including providing reinforcement either 20mm wide 3mm thick M.S. flats or 6 mm dia M. S. bars - 2 Nos. at every 90cm interval. The rate should include charges for cutting, chasing the existing brick wall / floor or concrete surface to make proper bonding with the surface including racking out the joints, curing, cleaning the site, necessary scaffolding at all levels etc., complete as per directions of the Engineer-in-charge and as per specification.				
	Approximate quantity	<b>SQMT</b>	<b>30.00</b>		

Mode of measurements: Volume in length, width and height to the nearest Cm.

Units: Sq. Mtr.

Rate in words : Rupeesí .....í í í .....only per M<sup>2</sup>

7.	<b><u>BRICKWORK 230MM THICK:</u></b>  Brickwork for super structure 230 mm. thick made out of well burnt bricks confirming to BIS 1077 1986 specification in cement mortar 1:4 in				
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	any location / floor. All materials such as brick, cement, fine aggregate, water etc., should confirm to relevant BIS specification and the workmanship should also confirm to the relevant specification The rate should include charges for cutting, chasing the existing brick wall / floor or concrete surface to make proper bonding with the surface including racking out the joints, curing, cleaning the site, necessary scaffolding at all levels etc., complete as per directions of the Engineer-in-charge and as per specification.				
	<b>Approximate Quantity</b>	<b>CUM</b>	<b>5.00</b>		
<p>Mode of measurements: Volume in length, width and height to the nearest Cm. Units: Cubic Mtr.</p> <p>Rate in words : Rupeesí .....í í í .....only per M<sup>3</sup></p>					
8.	<p><b><u>EXTERNAL WATER PROOF CEMENT PLASTER IN TWO COATS :</u></b></p> <p>The work needs to be carried out from ground floor to terrace and necessary scaffolding</p> <p>Providing and applying water proof cement plaster minimum of 20 mm thick, 1:4 or the thickness should be as per the site condition mixed with liquid integral water proofing compound manufactured by Roff / Cica in proportion of 150 to 250 ml per 50 kg. of cement, minimum of 20 mm thick in two coats. The base coat should be 12 mm thick finished rough and the finishing coat should be minimum of 8 mm thick finished in smooth surface as per the site requirement in line, level and in plumb. All complete including scaffolding, curing etc. as per standard specification and as directed by the Engineer-in-charge.</p> <p>The cement mortar should be mixed with ðFair Fibre ð or Equivalent to be mix with cement mortar as per the manufacturer specification to improve the compressive strength of the cement mortar and also arrest the shrinkage and crack.</p>				

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	Note:- Contractor needs to prevent all external windows, glasses, window grills and window shades. If any damages, the contractor needs to replace or repair by the contractor own cost.				
	<b>Approximate Quantity</b>	<b>SQ.MT</b>	<b>50.00</b>		
Mode of measurements: Area in length and height form the front elevation to the nearest cm. Units in Sq. Mtrs					
Rate in words : Rupees í í í í í í í í í í í í í í í í í í .only per M <sup>2</sup>					

<b>9</b>	<b><u>REPAIRING OF CHAMBER AND MANHOLE :</u></b>  Cleaning of existing manhole and disposal of waste material to a suitable and authorized municipal place and repairing the internal/ external walls complete with water proofing plastering and repairing of pipe connections including laying concrete in proportion of 1:2:4 as required.  This item includes inspection of the Chamber and manhole of any size and providing of Pre cast RCC Manhole cover with suitable size M.S frame and the same to be fixed in cement concrete over the 230mm thick brick work as required as per the relevant specification and as directed by the Engineer-In-Charge.				
	<b>Approximate quantity</b>	<b>No</b>	<b>02</b>		
Mode of measurements: Counting of each one by one Unit in No					
Rate in words : Rupees í í í í í í í í í í í í í í í í í í .only per Nos					
<b>10.</b>	<b><u>WATER TANK:</u></b>  Supply and fixing Sintex Make (CCWS 500.02) Rust Proof, Light weight/Maintenance free Water storage Tank of capacity 5000 liters and size of dia. 2000 mm. height 2000 mm. & manhole of size 940 mm.				
	<b>Approximate quantity</b>	<b>No</b>	<b>05</b>		
Mode of measurements: Counting of each one by one Unit in No					
Rate in words : Rupees í í í í í í í í í í í í í í í í í í .only per No					

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11.	<b><u>PLATEFORM FOR WATER STORAGE TANK</u></b>  Providing and Fixing of M.S frame work for making of platform for water storage tank made up of various M.S section, suitable for supporting the load of fully filled with water sintex water storage tank of capacity 5000 ltrs. The water tank is of size dia. 2000 mm.& height 2000 mm. & manhole of size 940 mm. The item includes making holes/cutting of walls/column/welding etc and making good the surface with cement and sand.  The M.S frame work to be finished with red oxide primer and three coat of Enamel paint. All as required as per the site.				
	<b>Approximate quantity</b>	<b>Kg.</b>	<b>4000</b>		
Mode of measurements: Counting of each one by one Unit in No  Rate in words : Rupees í í í í í í í í í í í í í í í í í í í .only per No					
12.	<b><u>PAINTING – WALL / DUCT / SHAFT</u></b>  Erecting, Scaffolding at all levels, preparing the surface by rubbing the surface by sand papers of different grade, removing all dirt, smoke, grease, loose plaster etc., if any, from the existing surface cleaning the surface thoroughly and removing all dirt from the surface if any. Providing and applying three coats of approved quality paints over required number of coats approved cement primer in all ceilings, internal walls and internal surface of the external walls, ceilings, false ceiling etc., all complete including necessary carrying out lambi work with Birla white putty as per manufacturer's specification and finished in plain, clear and smooth or rough surface as per the site condition etc., standard specifications and as directed by the Engineer-in-Charge with Ist grade Acrylic Emulsion paint (vinyl base) of approved manufacturer like Asian, Nerolac, ICI, Berger of approved colour, shade and pattern and design. The rate shall include the required protection by covering the existing furniture by plastic sheet so as to avoid any damage and keeping the furniture in-tact, including complete cleaning after completing the painting, removing painting marks and making good the same. All complete as directed.				
	<b>Approximate Quantity</b>	<b>SQMT</b>	<b>250.00</b>		
Mode of measurements: Area in length and height from the front elevation. Units in Sq. Mtr.					

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Rate in words : Rupeesí í .....í í í í ....only per M<sup>2</sup>

**13. PAINTING – ENAMEL PAINT**

Cleaning the surface thoroughly and removing the external elements, if any, such as dust, dirt, grease etc., providing and applying one base coat of red oxide and three coats of Ist grade synthetic enamel paint of approved manufacturer in approved colour and brand. All complete including scaffolding, cleaning the site etc., as per specification and as directed by the Engineer-in-Charge.

Mode of measurements: Area in length and height from the front elevation.  
Units in Sq. Mtr.

Rate in words : Rupeesí í .....í í í í ....only per M<sup>2</sup>

**14. REPLACEMENT OF EXISTING WASTE, VENT AND SOIL C I PIPE :**

Carefully inspections of the existing C I Pipes and providing and fixing of following size of NECO or equivalent approved make centrifugally cast spun iron C I Pipes as per IS : 3989 with necessary clamps & fittings e.g bends, sockets etc., and suitable joint filler i.e lead or cement as provided in the existing system complete including testing for 100% leakage proof as required and as directed by the Engineer-In-Charge. The rates should include for necessary testing for leakage to the satisfaction of all concerned.

- a) 200 mm. dia C I Pipe
- b) 150 mm. dia CI Pipe
- c) 100 mm. dia C I Pipe
- d) 75 mm. dia C I Pipe

**a Approximate Quantity**

**RMT 10**

**b Approximate Quantity**

**RMT 10**

**c Approximate Quantity**

**RMT 10**

**d Approximate Quantity**

**RMT 10**

Mode of measurements: Length to the nearest Cm.  
Unit: Running Mtr.

A ) (Rupeesí .....í í í .....only per RM)

B ) (Rupeesí .....í í í .....only per RM)

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C ) (Rupeesí .....í í í .....only per RM)					
D ) (Rupeesí .....í í í .....only per RM)					
<b>15</b>	<b><u>REPAIRING OF HANGING CHAMBER/ MANHOLE :</u></b>				
	Carefully inspecting and cleaning of existing hanging manhole (any size) and disposal of waste material to a suitable and authorized municipal place and repairing the internal and outer surface with water proofing plastering and repairing of pipe connections as required including testing for 100% leak proof .				
	<b>Approximate quantity</b>	<b>No</b>	<b>05</b>		
Mode of measurements: Counting of each one by one Unit in No  Rate in words : Rupeesí .only per No					

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**Confirmation of Acceptance of Tender terms and conditions**

(To be signed by the bidder and enclosed along with their offer in a separate envelope)

We have studied the terms and conditions of Tender Enquiry including General and Special terms and conditions, the specifications, lay-out drawings, Schedule of Quantities, Commercial terms and conditions, Approved Makes, etc.

We are accepting all terms and conditions of the Tender without any deviation.

Offers with any deviations from the Tender Enquiry are likely to be rejected.

We also understand that the order / s will be placed in the name of principals only and not in the name of their dealer/s. Our quotation is based on the above.

**Date:** \_\_\_\_\_

**SIGNATURE OF TENDERER  
WITH RUBBER STAMP**

Contractor's Signature

Seal

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### **DECLARATION**

**I / We hereby declare that I / We have read and understood the Terms and Conditions of the contract, Specifications, Drawings, Schedule of Quantities etc. and hereby agree to abide by them. In token thereof, I / We have signed below and at the end of the Schedule of Quantities, failing which the tender is liable to be rejected.**

**I / We hereby confirm that only the relevant entries asked for, have been made within the Tender documents issued to us. I / We also confirm that in the event of any entry in this Tender document other than the relevant entry or condition shall make this Tender invalid.**

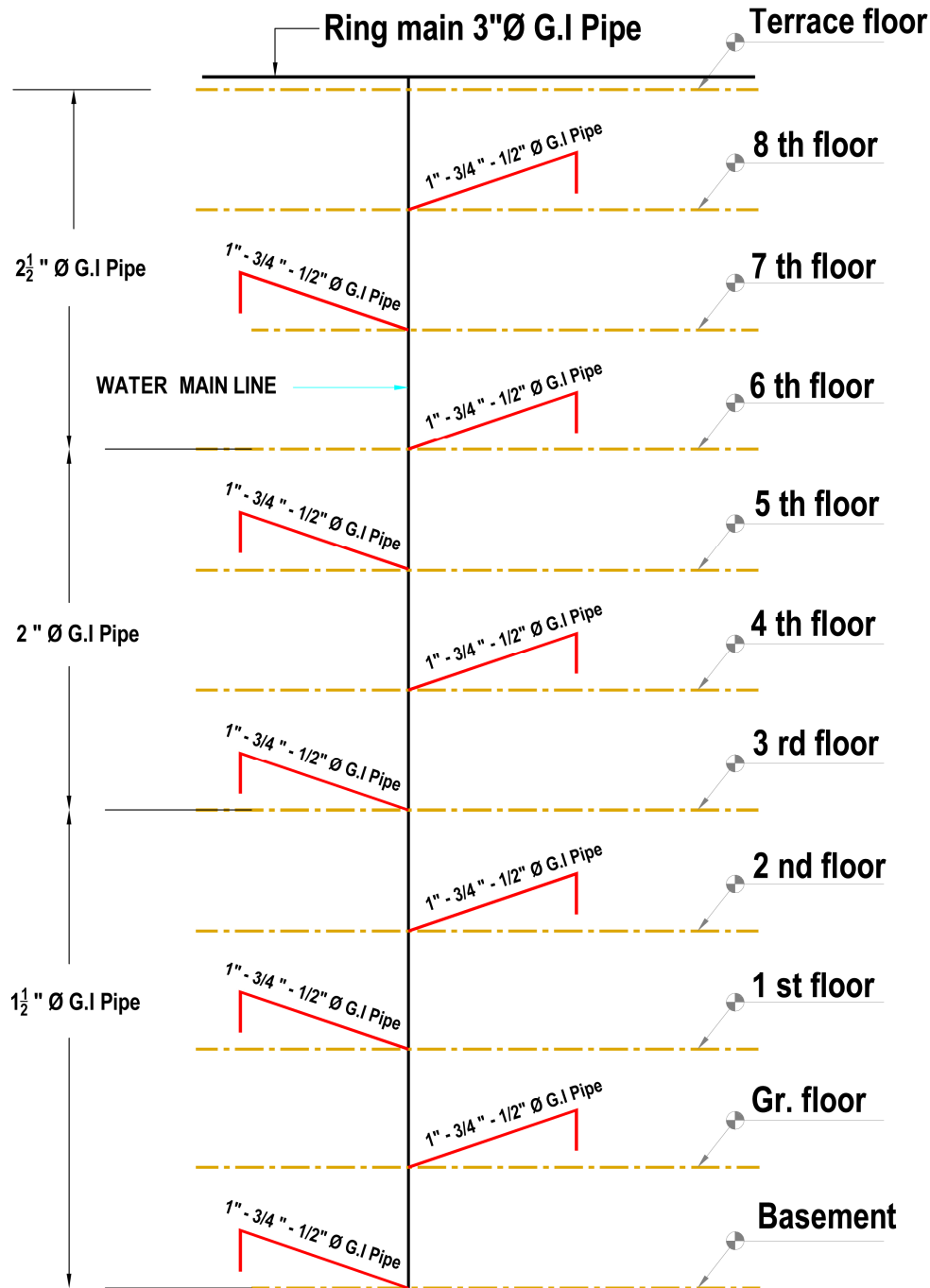
**Date : \_\_\_\_\_**

**SIGNATURE OF TENDERER  
WITH RUBBER STAMP**


Contractor's Signature

Seal

Client ID	55
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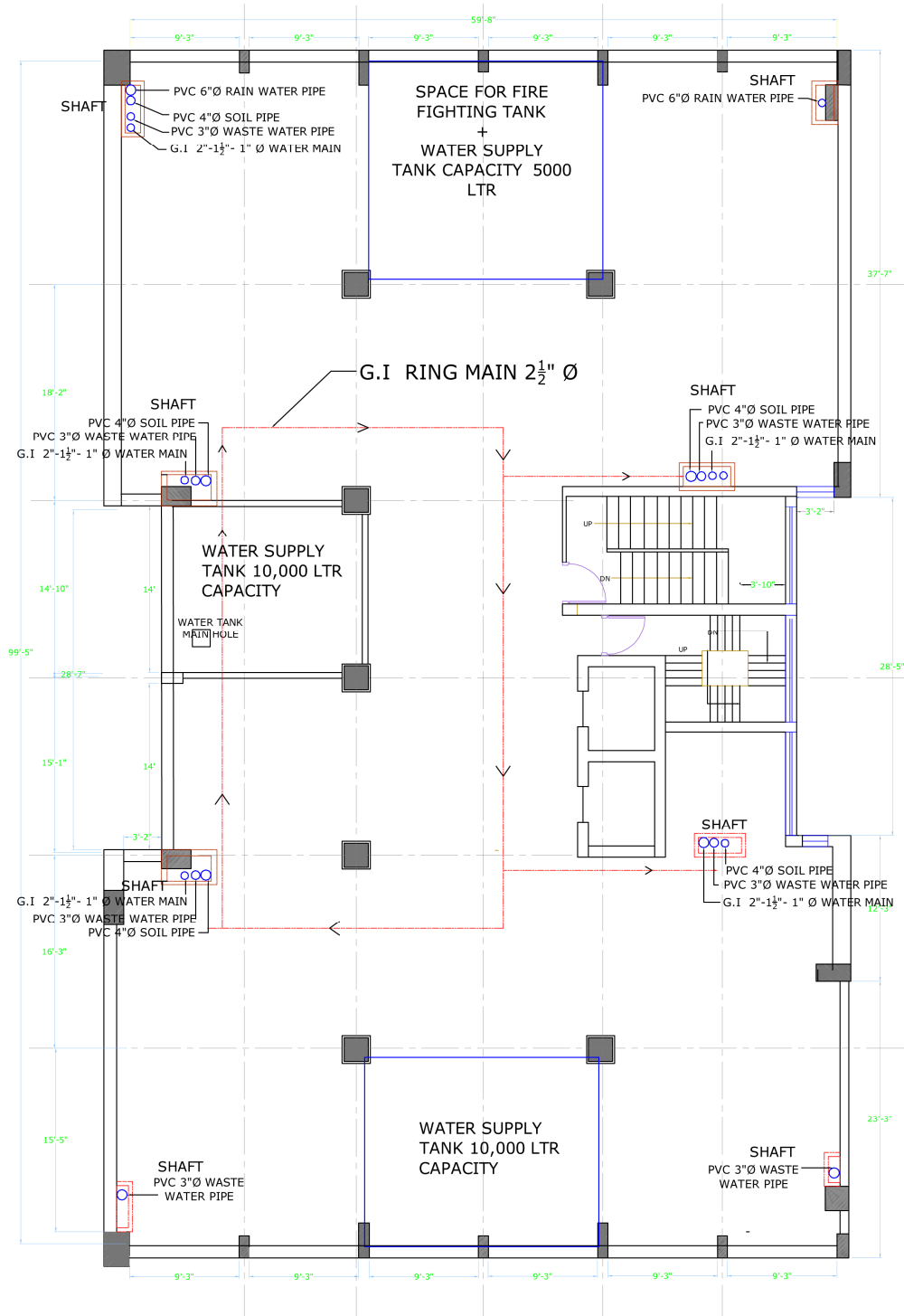


### TYPICAL PLUMBING DETAIL FOR ALL SHAFT

	REVISION	DATE :	DRAWING TITLE PLUMBING DETAIL	 UTI Infrastructure Technology And Services Limited
		FOR APPROVAL		
		FOR COMMENTS	CLIENT PANJAB AND SINDH BANK	DRAWING No. UTIITSL/PSB/DWG
		FOR INFORMATION		
		FOR REFERENCE	DATE 27.01.2015	CLIENT ID
		FOR RECORDS		
		FOR TENDER		




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**TERRACE PLAN**

**OR TYPICAL FLOOR SHAFT**

	REVISION	DATE:	DRAWING TITLE <b>TERRACE FLOOR PLAN</b>	 <b>UTI Infrastructure Technology And Services Limited</b>
	12.11.2012	FOR APPROVAL		
	26.11.2012	FOR COMMENTS		
		FOR INFORMATION		
		FOR REFERENCE		
		FOR RECORDS		
		FOR TENDER	CLIENT <b>PANJAB &amp; SINDH BANK</b>	DRAWING No. UTITSL/PSB/DELHI/DWG/
				CLIENT ID <b>55</b>
				DATE <b>27.01.2015</b>

<b>Client ID</b>	<b>55</b>
<b>Tender No.</b>	<b>1119</b>
<b>Page No.</b>	<b>90/90</b>

Contractor's Signature

Seal