

Client ID	35
Tender No.	1107
Page No.	1/93

Issued to M/s. _____

UTI INFRASTRUCTURE TECHNOLOGY AND SERVICES LTD.,MUMBAI

Address:. UTI Infrastructure Technology and Services Ltd., Jeevan Tara Building, 5, Parliament Street, New Delhi – 110001 Tel No: 011-23741289
Name of work:

Electrical & other Allied work to be carried out in the office premises of UTI Infrastructure Technology & Services Ltd at Ground Floor, Jeeva Tara, 5, Parliament Street, New Delhi-110001

Estimated Cost	:	Rs 89,000.00
Last date of submission of tender	:	03.00 p.m. on 08/ 01/ 2015
Date of opening of the Tender	:	03.30 p.m. on 08 /01/ 2015
Venue of the Tender opening	:	UTI Infrastructure Technology and Services Ltd.,Jeevan Tara, 5, Parliament Street, New Delhi-110001
Validity of Tender from the date of opening	:	60 days
Time of commencement from the	:	Within 7 days from the date of Letter of intent (LOI) or actual Commencement whichever is Earlier.
Stipulated period of Completion	:	Within 15 days from the date of Commencement
Documents to be provided	:	i)CAR Policy and Workmen Compensation policy during the contract Period from approved Insurance Co within 3 days from the date of LOI , and Fire Policy for the period of one year from the completion of the Works ii) Indemnity regarding Central Excise Payments Plus Agreement within 7 days from the Date of LOI
Earnest Money Deposit		Rs. 1800.00 (One Thousand Eight Hundred Only) in favour of “UTI Infrastructure Technology and Services Limited “Payable at Delhi.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	2/93

UTI Infrastructure Technology And Services Ltd.

INDEX

Sr. No.	Details	Page Nos.
1.	Tender Notice & Contract summary	3-16
2.	Summary	17-18
3.	Format of indemnity for Statutory taxes etc.	19
4.	Format of undertaking to pay the duties	20
5.	Articles of Agreement	21-22
6.	Special Conditions	23-25
7.	Preamble to BOQ	26
8.	List of materials (Approved makes)	27-31
9.	Specification (Furnishing)	32- 67
10.	Specification (Electrical)	68-86
11.	Summary of Bill of Quantities	87
12.	Bill of Quantities	88-90
13.	Confirmation of Acceptance of terms and conditions	91
14.	Declaration	92

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	3/93

UTI Infrastructure Technology And Services Ltd.

Tender Notice

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.

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 and on Government website 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.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	4/93

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 in valid. 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 UTIITSLs’ website 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.

Client ID	35
Tender No.	1107
Page No.	5/93

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.

Client ID	35
Tender No.	1107
Page No.	6/93

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. 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:**
- Revokes the tender or increases the earlier quoted rates within the validity period.
 - Refuse, delay to sign and execute the contract after tender is accepted.
 - 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 :**
- 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.
 - 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.

Client ID	35
Tender No.	1107
Page No.	7/93

3. Time allowed for execution of work, as specified in tender, shall be the essence of the contract.
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.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	8/93

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.

Client ID	35
Tender No.	1107
Page No.	9/93

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.

Client ID	35
Tender No.	1107
Page No.	10/93

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

Client ID	35
Tender No.	1107
Page No.	11/93

completed and got certified from the concern client and forwarded to us for releasing the Security Deposit.

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.

Client ID	35
Tender No.	1107
Page No.	12/93

- 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.
- 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

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	13/93

completes the entire work as per the specification and joint inspection of work by the Engineer-in-charge and tenderer.

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

Client ID	35
Tender No.	1107
Page No.	14/93

goods are manufactured or produced at the site then Excise Invoice showing that the Central Excise has been paid should be submitted to UTIITSL.

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 3rd 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.

Client ID	35
Tender No.	1107
Page No.	15/93

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.
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.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	16/93

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 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 20th 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.**

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	17/93

UTI Infrastructure Technology And Services Ltd.

Summary		
1.	Time of Completion	30 days 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.	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.
7.	Insurance policy Within 3 days of LOI	<ol style="list-style-type: none"> 1. 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. 2. Third Party Insurance - Rs.1 Lac per accident. 3. Workmen Compensation policy 4. Fire Policy for the Period of one Year from the Completion of the work for the value of the Final bill Value.
8.	Defects Liability Period	12 (Twelve) months from the date of virtual completion / handing over of site to the client
9.	Terms of Payment	1. No advance

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	18/93

		<p>2. All the payments (running bills and final bill) shall be released to the tenderer on back to back basis once the payment is received from the client.</p> <p>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</p>
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

Client ID	35
Tender No.	1107
Page No.	19/93

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 – 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

Client ID	35
Tender No.	1107
Page No.	20/93

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

Client ID	35
Tender No.	1107
Page No.	21/93

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

Client ID	35
Tender No.	1107
Page No.	22/93

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 :
- i) Tender documents serial pages _____ to _____ dated _____.
 - ii) Subsequent correspondence and written instructions from time to time on the work
 - iii) Work order no. _____ dated _____
 - iv) 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.....

Name : _____

Address : _____

Date : _____

In the Presence of

Signature : _____

Name : _____

Address : _____

Date : _____

Client ID	35
Tender No.	1107
Page No.	23/93

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.
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.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	24/93

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 contractor shall submit the single line drawing of electrical installations/ wiring of completed work along with the final bill.
14. The contractor shall submit the Test Certificate of the Electrical installations carried out by him as per requirement of local Electrical supply Authority, Indian Electricity Rules, and Indian Electricity Act.
15. The work shall be carried out on holidays and Sundays, after and before office hours with the due permission of the UTIITSL/ 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.
16. The successful tenderer shall depute one electrician and one helper during office hours to avoid any electrical breakdown in electrical installation.
- 17. 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**

Client ID	35
Tender No.	1107
Page No.	25/93

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.

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 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.

14. 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 :

15. UTIITSL/ 590 /Empanelment/2014-15 dated 15-04-2014
16. UTIITSL/ 593 /Empanelment/2014-15 dated 15-04-2014
17. UTIITSL/ 595 /Empanelment/2014-15 dated 15-04-2014
18. UTIITSL/ 2638/Empanelment/2014-15 dated 09-06-2014
19. 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.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	26/93

UTI Infrastructure Technology And Services Ltd.

PREAMBLE TO THE BILL OF QUANTITIES

The work proposed to be carried out at the proposed Office premises as mentioned on cover page, the premises is proposed to be provided with Furnishing, civil, Electrical and LAN cabling works. 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 items. 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.

Client ID	35
Tender No.	1107
Page No.	27/93

LIST OF MATERIALS OF APPROVED BRAND AND/OR MANUFACTURE – FURNISHING

1.	Commercial plywood .as per IS 303	Garnet /Samrat / / Kenwood / Century / Donear / Mayur /mars /Archid ply / Green/ Century.
2.	Marine/ water proof plywood as per BIS 303	Garnet /Samrat / / Kenwood / Century / Donear / Mayur /mars /Archid ply / Green/ Century.
3.	Flush Door confirming to relevant BIS	Kutty / Garnet
4.	Block Board confirming to relevant BIS	Garnet /Samrat / / Kenwood / Century / Donear / Mayur /mars /Archid ply / Green/ Century
5.	One side Laminated sheet (1 mm thick)	FORMICA/ Decolum/ National / Green / Euro/ Merino / Neoluxe.
6.	One side Laminated sheet (1.5 mm thick)	Signature / Royal / International / Euro / Merino.
7.	12 mm thick pre-laminated (on both sides) particle board	NOVAPAN (India) Ltd.,.
8.	ACP	Al Strong, Superbond, Euro Bond
9.	Soft Board	Jolly Board.
10.	Veneer	Composed veneer / Donear / Garnet
11.	Veneer – Indian	Garnet / Donear / Kit ply.
12.	Melamine Finish	Wood coat pigmented (2 coats) manufactured by M/s. MRF Ltd. / Asian Paints – as per manufacturers specification
13.	Glazing	Tata Float / Modi / Saint Gobian
14.	Glazing (Clear)	Modi / Hindustan / Tata
15.	Mirror	Modi
16.	Tower bolt	Jyoti/ / Flora.
17.	Ball catch ordinary	Brass Heavy Duty
18.	Vitrified Tile	H.R.Johnson, / Marbitto / Kajaria/
19.	Handle	Brass lacure quoted / brush finish
20.	Hinges for cupboards – with stainless steel rod	Heavy-duty brass 4” for the cupboard shutters.
21.	Hinges for cupboards – with stainless steel rod	Heavy duty
22.	Box Hinges	Lama Imported
23.	Drawer Guide – Telescopic	Efficient / Earl Bihari.
24.	Drawer Guide – Regular	Earl Bihari Pvt. Ltd..
25.	Keyboard – Indian	Earl Bihari Pvt. Ltd..

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	28/93

26.	Keyboard – Imported with HDP	BTC – first quality
27.	Screws	GKW or equivalent
28.	Lock for drawers – multi lock	Efficient
29.	Lock – for cupboards	Godrej
30.	Door Lock – Cylindrical lock	YELE / Union / Godrej
31.	Door Lock – Mortise	Godrej
32.	Night latch	Godrej / Yele
33.	Door Closure	Garnish / Hyper / Everlite
34.	Floor Spring	Everite/ Garnish
35.	Door stopper	Earl Bihari Pvt. Ltd..
36.	Aluminum Section	NALCO / HINDALCO / JINDAL
37.	Adhesive for wood	Fevicol / Vamicol
38.	Rubberised adhesive	SR 998 or SR Express of M/s. Pedilite Industries.
39.	Acrylic sheet	Imported
40.	Asbestos cement sheet	Everest
41.	False Ceiling Sections	India Gypsum Ltd.
42.	Plaster of Paris	Approved quality
43.	Marble	First quality with uniform texture without any crack.
44.	Cement	Larsen & Tubro / ACC - 53 grade or high.
45.	Cement for fixing tiles as dado	Larsen & Tubro / ACC - 43 grade.
46.	White cement	Travancore cement/ Birla white
47.	Steel for reinforcement	TATA/SAIL conforming to BIS specification.
48.	Water proofing compounds	Roof/ Cica / Krishna Chemicals / Perma quick.
49.	Granamite Tiles	Bell Granito / Johnson
50.	Ceramic tiles	Kajaria/ NITCO/Johnson/Somani.
51.	Sanitary fittings	Hindustan Sanitary ware / Perry ware.
52.	Water supply fixtures	Jaguar & Co./ Essco
53.	CI Pipe & fittings – LA Class	Bangal iron Corporation
54.	GI Pipe – C Class	TATA/ zenrth
55.	Stoneware pipe – Grade A	Dalmia
56.	Cement pipe	Everest
57.	PVC Pipe & fittings	Prince/ Tribore
58.	Gate valve	Leader
59.	Pipe fittings	R Brand or equivalent
60.	Colour pigment	Rofee Compound
61.	Toilet Seat cover	Commander / Patel
62.	Toilet – Accessories	Jaguar & Co.
63.	Liquid Soap Container	ASCON Engineers
64.	Hand dryer	ASCON Engineers

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	29/93

65.	Paint	Nerolac/ Asian/ Berger / ICI
66.	Sensor DOOR Mechanisam	(Make - Godrej , Dorma , ozone)
67.	Sealant	Silicon – Dow Corning 995 Polysulphide – Pedilite Industries

**LIST OF MATERIALS OF APPROVED BRAND AND/OR MANUFACTURE –
ELECTRICAL**

ALL MATERIAL USED MUST HAVE ISI & FIA APPROVED

1.	Rigid PVC Conduit	:	Medium Gauge wall thickness ISI & FIA approved & manufactured from virgin material Precision, BEC , AKG
2.	Accessories for conduit	:	Same make as sr. no. 1 above.
3.	Copper Conductor PVC coated wire (Flexible) (FRLS)	:	As per IS:694-1977 of Finolex (FRLS), National (FRLS) / Havells / Polycab
4.	Modular Switches/sockets	:	MK India / Crabtree / Anchor Roma
5.	Main Switch fuse upto 63 Amps - A.C. 23 duty	:	L&T
6.	Above 63 Amps-A.C. 23 duty	:	L&T
7.	HRC Fuses	:	L&T
8.	MCBs	:	Legrand/Schneider/Havells
9.	MCB Distribution boards	:	Legrand/Schneider/Havells (Double Door), Factory fabricated ..
10	Rewirable Porcelain Fuse	:	CPL, KEW.
11	Telephone wires	:	Delton, Finolex as per ITD S/WS-113 B
12	PVC tape	:	Steel grip.
13	Compound	:	Shalimar No. 6
14	Main Cables down stream up to 35 sq.mm.	:	PVC armoured cable For 1.1 KV as per ISI 1554. CCI/ Asian / National/Polycab
15	Branched Cable downstream from 35 sq.mm.	:	CCI/ Asian / National / Polycab
16	Glands	:	Double compression type, siemens type with rubber ring and double washers (Sample to be approved) Comet/ Comex
17	Cable Lugs	:	Dowells, 3-D.
18	Metal Clad Plugs	:	MDS/Crompton / Standard Koppe / Havells
19	Switch Plate	:	Decolam Hylam sheet 3.0 mm thick. OR

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	30/93

		Sintex SMC Sheets
20	Connectors/ Indicator	: Technic, Mimic (Static LED type), Technoplast, Porcelain
21	Button holder, Angle holder, ceiling rose	: Anchor, Precision
22	M.S.Conduit ISI 16 gauge	: BEC / AKG
23	M.S. Boxes	: Fabricated out of 16 gauge continuously welded (sample to be approved)
24	ELCB	: MDS / Legrand/Schneider/Havells
25	A.C.B. Drawout type (LT)	: L&T/schneider
26	Telephone tag block	: Chrono India Ltd.
27	Capacitor	: L&T / Crompton Greaves./ Datar /Siemens
28	Relay	: L&T
29	MCCB	: L&T./ Legrand / Siemens/Schneider
30	Meter	: Jaipur, Havells.
31	Light Fixture	: Phillips./GE/WIPRO/
32	Ceiling Fans	: Crompton / Orient / Havells
33	Exhaust Fan	: Crompton.with PVC body.
34	Electronic call bell / timer	: Anchor / Precision
35	TV Cable	: Finolex./POLYCAB
36	Volt meter & Ammeter (Digital)	: Meco, AE
37	Current Transformer	: AE, Kappa
38	L. T. Panel	: L&T or fabricated by CPRI approved fabricator
39	Data cabling & its Components Cat – 6	: Systemax / Avaya / Tyco / DG Link
40	Change over switch	: Havells / HPL / GE
41	24 port jack Panel	: Systemax
42	4U/9U / 12U / 15U Rack for jack panel	: Systemax / Valrack / AMP
43	RJ 45	: Systemax / AMPS / DG Link
44	RJ 11	: Systemax / AMPS / DG Link
45	Voice Cabling Cat 5	: Systemax / Avaya / Tyco / DG Link
46	DATA Cable Cat 6	: Systemax / Avaya / Tyco / DG Link
47	Conventional Fire Alarm Panel, Detectors, MCP,RI,, Hooter	: Honeywell/Notifier/System Sensor/Agni/Secutron/Zicom/Apollo
48	Fire Extinguisher	: Minimax/Ceasefire
49	Air-conditioning Machines- Window/Hi-wall Split , Cassettee	: Voltas/Carrier,Blue Star/Hitachi/
50	Voltage Stabilizer	: V-Guard/BlueBird/Carrier/Voltas

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	31/93

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NOTE :-

- *Wherever more than one make are indicated, the contractor should use the material indicated first. UTIITSL will permit to use the material indicated 2nd and hereafter only if the material indicated 1st 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.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	32/93

UTI Infrastructure Technology And Services Ltd.

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.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	33/93

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.

S.1. WOOD

A. **Teak means** : Superior quality, Dandeli, Bellarsha, Chandrapur, Gana, Malabar Teak seasoned, uniform colour, straight grain and shall be free from large, loose, dead knots, cracks, warps, twists, bends, borer holes, shakes, sap wood or any other defect. No individual knot shall be more than 1 cm in dia. The annual growth rings shall be 6 Nos. per 2.5 cm. The moisture content shall not exceed 12%.

B. **White Cedar means** : First class well seasoned Indian White cedar wood uniform in colour, straight grains, with out any knots. It shall be free from large loose dead knots, cracks, shakes, warps, twists, bends, sapwood or defects of any kind. No individual hard and sound knot shall be more that 2.5 cm. in diameter and aggregate area of all knots shall not exceed 1% of the area of the piece. There shall not be less than 6 growth rings per 2.5 cm width. The moisture content does not exceed 12%.

C. The wood should be seasoned as per BIS 1141- 1958 or its latest edition.

D. TIMBER :

The moisture content does not exceed the following limits :

Timber for frames : 14%

ii) Timber for planking shutters : 12%

In measuring cross sectional dimensions of the Frame pieces tolerances upto 1.5 mm shall be followed for each planed surface.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	34/93

E. FIRST CLASS INDIAN TEAK :

First class Indian Teak means best quality Burma Teak and well seasoned. It shall be of uniform colour, **straight grains** and shall be free from large loose dead knots, cracks, shakes, warps, twists, bends, sapwood or defects of any kind. No individual hard and sound knot shall be more than 2.5 cm. in diameter and aggregate area of all knots shall not exceed 1% of the area of the piece. There shall not be less than 2-3 growth rings per 2.5 cm width.

S.2. PLYWOOD :

Strictly in accordance with IS 303 : 1989

- i) Grades : Plywood for general purposes shall be of the following two grades, depending upon the bond strength developed by the adhesive used for bonding the veneers:

Boiling water resistant or BWR Grade and

Moisture resistant of MR Grade

These shall be manufactured in accordance with relevant IS codes i.e. IS 303 : 1989. The grades shall conform to the general requirements given as per relevant IS codes i.e. IS 303 : 1989 (Third Revision)

Plywood for general purposes shall be classified into three types, namely, AA, AB and BB based on the quality of the two surfaces, namely, A and B in terms of general permissible defects. The type of plywood shall, therefore, be designated by the kind of surfaces of the panels. The better quality surface shall be called 'face', and the opposite side shall be called 'back'. If the face and the back are of the same quality, they are not distinguished. This type of plywood shall denote first the quality of face followed by the quality of back. For example, Type AA shall have both surfaces of quality of A. Type AB shall have face of quality A and the back of quality B and Type BB shall have both the surfaces of quality B.

The quality requirement of each of the surfaces mentioned should be as per IS 303 : 1989, However, the maximum number of categories of defects, permitted on any one surface of the panel shall be restricted in accordance with the requirements.

MATERIALS:

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	35/93

Timber: Any species of timber may be used for plywood manufacture as per IS 303 : 1989 (Third Revision).

Adhesive: The adhesive used for bonding the veneers in different grades of plywood shall be the corresponding type of adhesive as specified in IS 848 : 1974.

Extenders conforming to IS 1508 : 1972 may be used with the synthetic resin adhesive (aminoresins). However, synthetic resin adhesives (aminoresin) when extended by more than 25 percent shall contain suitable preservative, chemicals in sufficient concentration to satisfy the mycological test.

MANUFACTURE :

The veneers for all the grades shall be either rotary cut or sliced. The veneers shall be sufficiently smooth to permit an even spread of adhesive. Treatment as specified below shall be given to the plywood either at the veneer stage or after converting the veneers into boards.

Treatment :

Veneers from non-durable species and sapwood of all species when used for plywood manufacture shall be soaked in 1.25 percent solution of boric acid or 1.9 percent solution of borax at a temperature of 85-90 degree centigrade for a period of 10-40 minutes depending upon the thickness of the veneers or the veneers may be dipped in 2 percent solution of boric acid or 3 percent borax solution for 2 minutes and block stacked at least for two hours. Alternatively, the veneers may be soaked at an ambient temperature in a mixture of 0.5 percent solution.

For BWR grade of plywood bonded with synthetic resin adhesive, the preservative may be given conveniently after boards come out of the press, while still hot or the treatment given to the veneers before bonding.

For BWR grade, fixed type of preservative may be used according to relevant IS code i.e. IS 5539 : 1966.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	36/93

Assembly :

The thickness of all veneers shall be uniform within a tolerance of ± 5 percent. Corresponding veneers on either side of the central ply and those of face and back veneers shall be of species having similar physical and mechanical properties, such as, density, modulus of elasticity, shrinkage, etc. to ensure balanced construction.

Joints in Veneers:

Veneers that require to be joined to form a ply shall be spliced (edge jointed) before assembly. All joints shall be cut square. They may be taped on the face of the outer veneers in which case the tape shall be removed at a later stage, and metal clips or staples, if used, shall be removed. Perforated tapes may be used on the glue side of the veneers. In assembly, joints in veneers running in the same direction shall be staggered. End joints and butt joints shall not be permitted for any of the surfaces.

Grain Directions

Unless otherwise specified, and except in boards comprising an even number of plies, the direction of grain of the veneer in adjacent plies shall be at right angles to each other, and that of the outer plies shall run parallel to the longer side of the board. In boards comprising even number of plies, the grain of the centre pair shall follow the same direction. In adjacent plies, the grain should be at right angles to each other. However, a deviation not exceeding 10 degree may be permitted. In all cases, the grain on both faces of the assembly boards shall run in the same direction.

Scarf Joints:

When sizes larger than the available press sizes are required, scarf joints through the thickness of the board are permitted. All scarf joints shall be bonded with the same or a better adhesive than the one used for the manufacture of plywood, and shall be made with an inclination not greater than 1 in 12.

Permissible Defects:

Gaps in cores and cross-bands may be permitted except for 3 ply plywood provided the width of the gap does not exceed 1 mm in case of and 2 mm in case of plywood of more than 5 ply and provided such gaps, if more than one, shall be spaced not less than 80 mm away from each other and are staggered not less than 50 mm away as between ply, the next ply having the same grain direction.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	37/93

Splits in cores and cross-bands may be permitted to an extent of 2 per core or cross band.

Overlap shall not be permitted.

DIMENSIONS AND TOLERANCES :

The dimensions of plywood boards shall be as given in IS 12049 : 1987.

Thickness: Unless otherwise specified, thickness of plywood boards shall be as specified in Table. The thickness shall be measured up to one place of decimal.

Tolerances :

The following tolerances on the nominal sizes of finished boards shall be permissible:

	<u>Dimension</u>	<u>Tolerance</u>
a)	Length	+ 6mm 0mm
b)	Width	+ 3mm 0mm
	Thickness	
	1) Less than 6 mm	+/- 10%
	2) 6 mm and above	+/- 5%
d)	Squareness	0.2%
e)	Edge straightness	0.2%

Thickness of Plywood Boards as per IS 303 : 1989 (Third Revision)

WORKMANSHIP AND FINISH :

The plywood boards shall be of uniform thickness within the tolerance limits as per IS 303: 1989 (Third Revision).

The faces of plywood boards shall be reasonably smooth and face veneers shall be of reasonably uniform thickness. Slight sanding may be given to rough boards in order to make them reasonably smooth. The

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	38/93

squareness and edge straightness of the board when measured according to the procedure given as per IS 303: 1989 (Third Revision).

S.3. BUILDERS HARDWARE

All hardware fittings and fixtures shall be made with structural properties to sustain safety and withstand strains and stresses to which they are normally subjected to such as opening and closing, wind pressure etc. The fittings shall generally confirm to relevant specifications.

They shall be made true, clear, straight with sharply defined profiles and unless otherwise shown or specified with true smooth surfaces and edges, free from defects.

The metal shall be treated with finish as specified in the schedule of quantities.

S.4 GLASS

Glass shall be of specified thickness Indian plain glass of approved manufacturer without any waves, air holes etc.

S.5. BUTT HINGES

Hinges should be of any manufacturers with 14 gauge Brass body with stainless steel rod to be fitted with the shutter etc. with G.I. standard screws.

Brass hinges shall be manufactured by casting, unless it is specifically mentioned that the same shall be extruded type in which case these shall be manufactured from extruded sections. The size of butt hinges shall be taken as length of the hinge. The central pins/rod should be of stainless steel only.

S.6. TOWER BOLT

Tower bolts to be of anodized Aluminum powder coated heavy duty and are to be fitted with the shutter with powder coated screws and to be of M/s Jyothi make or equivalent.

S.7. LOCK

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	39/93

Cupboard lock should be M/s Godrej make.

Door lock should be cylindrical of M/s Godrej / YELE make with approved handles. The same lock as existing, wherever specified should be used.

S.8. PAINTING

SCOPE OF WORK : The work covered under these specifications consists furnishing the various types of paints and also the workmanship for these items, in strict compliance with these specifications, which are given in detail hereinafter with the item of schedule of quantities.

MATERIALS : Paints, oils, varnishes etc. of approved brand and manufacture shall be used. Ready mixed paints as received from the manufacture without any admixture shall be used.

If by any reason, thinning is necessary in case of ready mixed paint, the brand of thinner recommended by the manufacturer or as instructed by the Engineer-in-charge shall be used.

Approved paints, oils or varnishes shall be brought to the site of work by the contractor in their original containers in sealed condition. The material shall be brought in at a time in adequate quantities to suffice for the whole work or at least a fortnight's work. The materials shall be kept in the joint custody of the contractor and the Engineer-in-charge. The empties shall not be removed from the site of work, till the relevant item of work has been completed and permission obtained from the Engineer-in-charge.

COMMENCING WORK : Painting shall not be started until and unless the Engineer-in-charge has inspected the items of work to be painted, satisfied himself about their proper quality and given his approval to commence the painting work.

Painting, except the priming coat, shall generally be taken in hand after all other builder's work is practically finished.

The rooms should be thoroughly swept out and the entire building cleaned up, at least one day in advance before the paintwork is started.

Client ID	35
Tender No.	1107
Page No.	40/93

PREPARATION OF SURFACE :The surface shall be thoroughly cleaned and dusted. All dirt, rust, scales, smoke and grease shall be thoroughly removed before painting is started. The prepared surface shall have received the approval of the Engineer-in-charge after inspection, before painting is commenced.

APPLICATION : Before pouring into smaller containers for use, the paint shall be stirred thoroughly in its containers. When applying also, the paint shall be continuously stirred in the smaller containers so that consistency is kept uniform.

The painting shall be laid on evenly and smoothly by means of crossing and laying off, the latter in the direction of the grain of wood. The crossing laying off, consists of covering the area with paint, brushing the surface hard for the first time and then brushing alternately in opposite directions two or three times and then finally brushing lightly in direction at right angles to the same. In this process, no brush marks shall be left after the laying off is finished. The full process of crossing and laying off, will constitute one coat.

Where so stipulated, the painting shall be done with spray, spray machine used may be (a) a high pressure (small air aperture) type of (b) a low pressure (large air gap) type, depending on the nature and location of work to be carried out. Skilled and experienced workmen shall be employed for this class of work. Paints used shall be brought to the requisite consistency by adding a suitable thinner.

Spraying should be done only when dry condition prevails.

Each coat shall be allowed to dry out thoroughly and rubbed smooth before the next coat is applied. This should be facilitated by thorough ventilation.

Each coat except the last coat, shall be lightly rubbed down with sand paper or fine pumice stone and cleaned of dust before the next coat is laid.

No left over paint shall be put back into the stock tins, when not in use, containers shall be kept properly closed.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	41/93

No hair marks from the brush or clogging of paint puddles in the corners of panels, angles of mouldings etc. shall be left on the work.

In painting doors and windows, the putty round the glass panes must also be painted, but care must be taken to see that no paint stains etc. are left on the glass. Tops of shutters and surfaces in similar hidden locations shall not be left out while painting. Perspect covers of electrical switch boxes have to be painted from inside by removing them. Care shall be taken while removing them in position after painting with respective approved paints. In painting steel work, special care shall be taken while painting over bolts, nuts, rivets, overlaps etc.

The additional specifications for primer and other coats of paints shall be as accordance to the detailed specifications under the respective headings of IS codes.

BRUSHES AND CONTAINERS : After work, the brushes shall be completely cleaned of paint and linseed oil by rinsing with turpentine. A brush in which paint has dried up is ruined and shall on no account be used for painting work. The containers, when not in use, shall be closed, kept air tight and shall be kept at a place free from dust. When the paint has been used, the containers shall be washed with turpentine and wiped dry with soft clean cloth, so that they are clean, and can be used again.

MEASUREMENTS :

Painting, unless other wise stated shall be measured by area in Sq.m. length and breath shall be measured correct upto two places of decimal of a metre.

No deductions shall be made for opening not exceeding 0.05 Sq.m. and no addition shall be made for painting to the beading, moulding edges, jambs, soffits, sills architraves, etc. of such small openings.

In measuring painting, varnishing, oiling etc. of joining and steel work etc. the co-efficients as in the following table shall be used to obtain the areas payable. The co-efficients shall be applied to the areas measured flat and not girthed in all cases.

In case of painting of door shutter with push plate in plastic/ laminate, deduction will be made for area of such laminates.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	42/93

Table of Co-efficients to be applied over areas of different surfaces to get equivalent plain areas

Sr. No.	Description of work	Multiplying Co-efficients	Remarks
	<u>WOOD WORK – DOORS, WINDOWS ETC.</u>		
1.	Pannelled or framed and braced doors, windows etc.	} }	
2.	Ledged and battened or ledged, battened and braced, doors, windows etc.	} 1 1/8 (for or 1.125 each side) }	
3.	Flush doors etc.	}	
4.	Part panelled and part glazed or gauzed doors, windows etc.	} 1 (for each side)	
5.	Fully glazed or gazed doors, windows etc.	½ (for each or 0.50 side)	
6.	Fully venetioned or louvered doors, windows etc.	1 ½ (for each or 1.50 side)	
7.	Trellis (or Jaffri) work one way or two way.	2 (for painting all over)	
8.	Carved or enriched work	2 (for each side)	
9.	Weather boarding	1 1/8 (for each or 1.125 side)	
10.	Wood shingle roofing	1 1/8 (for each or 1.125 side)	
11.	Boarding with cover fillets and match boarding	11/20 (for each or 0.55 side)	
12.	Tile and slate battening	¾ (for painting or 0.75 overall)	
	<u>STEEL WORK – DOORS, WINDOWS ETC.</u>		
13.	Plain sheeted steel doors or windows	1 1/8 (for each or 1.125 side)	
14.	Fully glazed or gauzed steel doors steel doors & windows	½ (for each side) or 0.50	
15.	Part panelled and part glazed or gauzed doors and windows	1 (for each side)	
16.	Corrugate sheeted steel doors or windows.	1 ¼ (for each side) or 1.25	
17.	Collapsible gates	1 ½ (for painting or 1.50 all over)	
18.	Rolling shutters of inter locked laths	1 ¼ (for each side) or 1.25	
	<u>GENERAL WORK :</u>		
19.	Expanded metal, hard drawn steel	1 (for painting all over)	

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	43/93

	wire fabric of approved quality grill work and gratings in Guard Bars, balustrades, railings & partitions.		
20.	Open palisade fencing and gates including standards, braces, rails stays etc. in timber or steel. Note: The height shall be taken from the bottom of the lowest rail, if the palisades do not go below it (or from the lower end of palisades, if they project below the lowest rail) upto the top of palisades but not upto the top of standards, if they are higher than the palisades.	1 (for painting all over)	
21.	Corrugated iron sheeting in roofs, side cladding etc.	1.14 (for each side)	
22.	A.C. corrugated sheeting in roofs, side cladding etc.	1.20 (for each side)	
23.	A.C. semi-corrugated sheeting in roofs, side cladding etc. or Nainital pattern using plain sheets.	1.10 (for each side)	
24.	Wire gauge shutters including painting of wire gauge	1 (for each side)	

Explanatory notes on the table of co-efficients.

1. Where doors, windows etc. are of composite types other than those stated, different portion shall be measured separately with their appropriate co-efficients, the centre line of the common rail being taken as the dividing line between the two portions.
2. Measurements for doors, windows etc. shall be taken for flat (and not girthed) over all including chowkats or frames, where provided. Where chowkats or frames are not provided, the shutter measurements shall be taken.
3. Collapsible gates shall be measured for width from outside of gate in its expanded position and for height from bottom to top of channel verticals. No separate measurements shall be taken for the top and bottom guide rails, rollers, fittings etc.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	44/93

4. Rolling shutters of interlocked laths if provided shall be measured for the actual shutter width and the height from bottom of the opening to the centre of the shaft. No separate measurements shall be taken for painting guides and other exposed features within or outside the shutters area. The painting of top cover or hood shall however be measured separately.
5. Co-efficients for sliding doors shall be the same as for normal types of doors in the table. Measurements shall be taken outside of shutters, and no separate measurements shall be taken for painting guides, rollers fittings etc.
6. Measurements of painting of doors, windows, collapsible gates, rolling shutters etc. as above shall be deemed to include painting all iron fittings in the same or different shade for which no extra will be paid.
7. The measurements as above shall be deemed to include also the painting of edges, blocks, cleats etc. for which no extra will be paid.
8. The co-efficients for doors and windows shall apply irrespective of the size of frames and shutters members.
9. When the two faces of a door, window etc. are to be treated with different specified finishes, measurable under separate items, the edges of frames and shutters shall be treated with the one or the other type offinish as ordered by the Engineer-in-charge, and measurement of this will be deemed to be included in the agreement of the face treated with that finish.
10. In the case where shutters are fixed on both faces of the frames, the measurement for the door frame and shutter on one face shall be taken in the manner already described, while the additional shutter on the other face will be measured for the shutter area only excluding the frame.
11. Where shutters are provided with clearance at top or/and bottom such openings shall be deducted from the overall measurements and relevant co-efficients shall be applied to obtain the area payable.

Client ID	35
Tender No.	1107
Page No.	45/93

12. In case of trellis (or jaffri) work, the measurements shall include the painting of the frame member for which no separate measurements shall be taken. Trellis door or window shutters shall also be measured under trellis work.
13. Wherever air conditioning grill, lighting, fixtures etc., in false ceiling are painted along with measurements shall be taken overall without deductions for opening in grills and no extra shall be paid for the grills. If grills fixtures etc. are not painted, area of fixtures or grill as measured flat (not girthed) shall be deducted when it exceeds 0.05 Sq.m. (individuals) where walls and ceiling are painted in separate colours, the junctions of two paints shall be brought down on the walls in a straight line by about 6 mm to 12 mm if so desired, if the junctions of walls and ceilings are not even. No extra shall be paid to the contractor on this account. Beading wherever provided shall not be measured separately but shall be deemed to be included in the area of false ceiling etc. measured flat (not girthed).
14. For painting open palisade fencing and gates etc. the height shall be measured from the bottom of the lowest rail, if the palisades do not go below it, (or from the lower end of the palisades, if they project below the lowest rail), upto the top of rails or palisades whichever are higher, but not upto the top of standards when the later are higher than the top rails or the palisades.
15. In the case of asbestos cement corrugated or semi-corrugated sheeting and iron corrugated sheeting in roofs, side cladding etc. the work shall be measured flat (not girthed) as fixed.
16. For trusses, compound girders, stachions, lattice girders, and similar work, actual area will be measured in Sq.m. and no extra shall be paid for painting on bolt heads, nuts, washers etc. even when they are picked out in a different tint to the adjacent work.
17. Painting of rain water, soil, waste, vent and water pipes, etc. **where the peripheral length is more than 10 cm.** shall be measured in running metres and multiply the same with the perimeter of the particular diameter of the pipe concerned. Painting of specials such as bends, heads, branches, junctions shoes, etc. shall be included in the length and no separate measurements shall be taken for these or for painting brackets clamps etc.

Client ID	35
Tender No.	1107
Page No.	46/93

18. Measurements of wall surfaces and wood and other works not referred to already shall be recorded as per actuals and opening exceeding 0.05 Sq.m. shall be deducted to get the net payable area length and breadth shall be measured correct upto two places of decimal of a metre and are so worked out shall be correct upto a two decimal of Sq.m.

19. In case the items of work requiring painting are inclusive of cost of painting the painting carried out shall not be measured separately.

Precautions : All furnitures, lightings, fixtures sanitary fittings, glazing, floors etc. shall be protected by covering and stains, smears, splashings, if any shall be removed and any damage done shall be made good by the contractor at his cost.

Rates : Rates shall include cost of all labour and materials involved on all the operations described above and in the particular specifications given under the several items.

General

A: MATERIALS

1. The priming coat for wood work, iron work or plastered surface shall be as specified in the description of the item.
2. The priming coat shall be prepared at the site of work or readymade primer of approved brand and manufacture shall be used.
3. Where primer for wood work is to be mixed at site, it shall be prepared from a mixture of red lead, white lead and double boiled linseed oil in the ratio of 0.7 Kg: 0.7 Kg : 1 Litre.
4. Where primer for steel work is to be mixed at site, it shall be prepared from a mixture of red lead, raw linseed oil and turpentine in the ratio of 2.8 Kg: 1 Litre: 1 Litre.
5. The specifications for the base vehicle and thinner for mixed on site, primers shall be as follows:-

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	47/93

- a) **White Lead:** The White lead shall be pure and free from adulterants like barium sulphate and whiting. It shall conform to IS: 103-1950 as amended from time to time.
- b) **Red lead :** This shall be in powder form and shall be pure and free from adulterants like brick dust etc. It shall conform to 102-1950 as amended from time to time.
- c) **Raw linseed oil:** Raw linseed oil shall be lightly viscous but clear and of yellowish colour with light brown tinge. Its specific gravity at a temperature of 30 degree C shall be between 0.923 and 0.928. The oil shall be of sufficiently matured quality, oil, turbid or thick, with acid and bitter taste and rancid odour and which remains sticky for a considerable time shall be rejected. The oil shall conform in all respects to IS :75-1950 as amended from time to time. The oil shall be of approved brand and manufacture.
- d) **Double boiled linseed oil :** This shall be more viscous than the raw oil, have a deeper colour and specific gravity between 0.931 and 0.945 at a temperature of 30 degree C. It shall dry with a glossy surface. It shall conform in all respect to IS: 77-1950 as amended from time to time. The oil shall be approved brand and manufacture.
- e) **Turpentine :** Mineral turpentine i.e. petroleum distillate which has the same rate of evaporation as vegetable turpentine (distillate product of Oleoresin of Conigers) shall be used. It shall have no grease or other residue when allowed to evaporate. It shall conform in all respect to IS: 83-1950 as amended from time to time.
6. All the above materials shall be of approved manufacture and brought to site in their original packings in sealed condition.
7. Primer containing lead shall not be used for painting iron/steel /wood work in the residential area.

Client ID	35
Tender No.	1107
Page No.	48/93

Preparation of surface:

8. **Wood work** : The wood work to be painted shall be dry and free from moisture. The surface shall be thoroughly cleaned. All unevenness shall be rubbed down smooth with sand paper and shall be well dusted. Knots, if any shall be covered with preparation of red lead made by grinding red lead in water and mixing with strong glue size and used hot.

The surface treated for knotting shall be dry before painting is applied. After the priming coat is applied, the holes and indentation on the surface shall be stopped with glazier's putty or wood putty (for specifications for glaziers putty and wood putty refer as mentioned here-in-before). Stopping shall be not be done before the priming coat is applied as the wood will absorb the oil in the stopping and the later is therefore to crack.

9. **Iron and steel work** : All rust and scales shall be removed by scraping or by brushing with steel wire brushes. Hard skin of oxide formed on the surface of wrought iron during rolling which becomes loose by rusting, shall be removed.

All dust and dirt shall be thoroughly wiped away from the surface. If the surface is wet, it shall be dried before priming coat is undertaken.

10. **Plastered Surface** : The surface shall ordinarily not be painted until it has dried completely. Trial patches of primer shall be laid at intervals and where drying is satisfactory, painting shall be taken in hand. Before primer is applied, holes and undulations, shall be filled up with plaster of paris and rubbed smooth.

Application : The primer shall be applied with brushes worked well into the surface and spread even and smooth. The painting shall be done by crossing and laying off as described here-in-before.

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

B. PAINTING WITH ORDINARY OR SUPERIOR QUALITY READY MIXED PAINT.

Client ID	35
Tender No.	1107
Page No.	49/93

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.

Client ID	35
Tender No.	1107
Page No.	50/93

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

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.

Client ID	35
Tender No.	1107
Page No.	51/93

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

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.

E PAINTING WITH ACRYLIC EMULSION PAINT/PLASTIC EMULSION PAINT

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

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	52/93

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.
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.

F: 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.

G: JOB REQUIREMENTS :

Note :

1) **PAINING 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.

Client ID	35
Tender No.	1107
Page No.	53/93

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.**

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 lime "Katani or equivalent". 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.

Client ID	35
Tender No.	1107
Page No.	54/93

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 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

Client ID	35
Tender No.	1107
Page No.	55/93

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 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.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	56/93

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.

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.

Client ID	35
Tender No.	1107
Page No.	57/93

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.

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 “Painting (General)” 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.

Client ID	35
Tender No.	1107
Page No.	58/93

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 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.

Client ID	35
Tender No.	1107
Page No.	59/93

- 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.

- 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.

H : **ANTI-TERMITE TREATMENT** :

Contractor’s Signature

Seal

Client ID	35
Tender No.	1107
Page No.	60/93

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.

I: CEMENT :

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

J: 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).

K: 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/cm² 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.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	61/93

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.

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 \varnothing 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 :-

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	62/93

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.
- 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.

L: CONCRETE :

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	63/93

Strictly confirming to BIS 456 – 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.

M: 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.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	64/93

- 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).

N: CEMENT GROUTING FOR R.C.C. MEMBERS

- Drill holes atleast 12 mm in diameter inside the concrete surface. In case of columns of 9” thickness the holes should be atleast 4” 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/cm² 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.

NOTES:

Cement : 53 grade

Mode of measurement: per no.

O. WATERPROOFING OF TOILETS

- Cleaning the existing RCC slab with water jet,
- Exposing the cracks in “V” grooves by carefully chipping along with the grooves by about 30 mm without damaging the slab,
- Filling the grooves with non shrinkable cement polymer mixture,

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	65/93

detecting the honey comb areas, fixing nozzles at a centre to centre distance of 300 mm for grouting, grouting non shrinkable grout made out of cement, air entering agents and clear water at a pressure of $2 \text{ Kg/cm}^2 - 3 \text{ Kg/cm}^2$, cutting the nozzles at the finished RCC level,

- The above should be air cured for 48 hrs and water cured for 3 days by water sprinkling or by wet gunny bags.
- The surface should be dampened and a slurry containing POLYALK WP: 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.
- After 24 hrs apply two more brush coats of slurry at intervals of 4 hrs.
- The coating thus formed should be air cured for 48 hours and then water cured for 3 days by sprinkling or wet gunny bags.
- Providing and applying water proof plaster 25mm thick, 1:4 mixed with liquid integral water proofing compound manufactured by Roff/Cica or as approved by the Engineer-in-Charge in proportion 150 to 250 ml/50kg of cement finished with neat cement slurry.
- Stocking water in the water proofed surface for 24 hrs all complete as per manufacturers specifications, standard practice and as directed by the Engineer-in-Charge.
- Curing is done for 14 days by making a pond.

NOTES:

Cement : 43 grade.

Sand : Washed River sand except for polymer mortar where quartz sand has to be used.

Mode of measurement: per sq.mtr.

Machine mixing for mortar.

Washed River shall used.

P. EXTERNAL PLASTER :

- Providing and applying water proof plaster 25mm thick, 1:4 for the 1st coat and 1:3 for the 2nd 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.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	66/93

- 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 – 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.
- 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.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	67/93

- 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 grade

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.)

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	68/93

TECHNICAL SPECIFICATIONS – (ELECTRICAL)

1.0 SCOPE :

- 1.1 The scope of work shall cover the installation, testing and commissioning of all power panels, incorporating circuit breakers, fuse units, busbars, interconnections, earthing etc., meeting the requirements shown in equipment schedule and the drawings, with good engineering practices.

2.0 CIRCUIT BREAKERS :

Circuit breakers shall be air relevant break horizontal draw out type fully interlocked and meeting the requirements of relevant IS:2516 or BS:3659. Breakers shall be rated for a medium voltage of 600 V and rated full load amperes as indicated on drawings. Breaker shall be capable of making and breaking system short circuits specified.

- 3.0 Breakers shall be, unless specified otherwise, manually operated, complete with front-of the panel operating handle, isolating plug with safety shutters, mechanical ON/OFF indicator, silver plated arching and main contacts, arc chutes, trip free operation. Breakers shall be capable of being raked out into 'Testing', 'Isolator' and 'Maintenance' positions and kept locked in any position. Breakers for remote operation shall be motor operated spring charged.

4.0 SWITCH FUSE UNITS & DISCONNECTS:

- 4.1 Switch fuse units shall have quick-make, quick-break silver-plated preferably double break contacts with operating mechanism suitable for rotary operation in the case of cubicle mounting. All switches shall be rated according to the equipment schedule or drawings and shall withstand the system prospective fault current let through. Cam operated rotary switches with adequate terminal adapters upto 25 A are acceptable but for all higher rating switch fuse units shall be heavy duty type conforming to IS 4047. All switches should be suitable for AC 23 duty.
- 4.2 Fuses shall be HRC cartridge type conforming to IS:2208 with a breaking capacity corresponding to system fault level. Fuses shall be link type with visible indication. Screw type diazed fuses are not acceptable for any ratings.

5.0 INSTRUMENT TRANSFORMERS, METERS & RELAYS :

- 5.1 Ammeters and Voltmeters shall have moving iron spring controlled dead-beat elements in square bezel flush type cases 144 mm. in size and suitable for switch board mounting. Meters shall conform to BS:89 and have grade 'A' accuracy. Scale ranges shall meet with the requirements or as indicated on the drawing or in the Schedule of quantities.

Client ID	35
Tender No.	1107
Page No.	69/93

5.2 Energy meters shall be two-element switch board mounting type suitable for unbalanced loads. In case of two incoming feeders, a summing C.T shall be provided with the meter. Meters shall conform to BS:37. The energy meters for DG Set & Transformers shall be calibrated and got certified by the respective State Electricity Board. All tripping may be through combination thermal and magnetic releases or IDMT releases as specified.

6.0 CUBICLE BOARDS :

6.1 All boards shall be combination of 14 & 16 SWG sheet steel, free standing, extensible, totally enclosed, dust tight, vermin-proof cubicle, flush dead front and modular construction suitable for 3 phase 415 V, 4 wire 50 Hertz system. All boards shall be accessible from the front for the maintenance of switch fuses, bus bars, cable termination, meters etc. Cables shall be capable of entering the board both from top as well as bottom. All panels shall be machine pressed with punched openings for meters etc. All sheet steel shall be rust inhibited through a process of de-greasing, acid pickling, phosphating etc. The panels shall be finished with powder coating of appropriate micron rating and of colour approved by the Engineer-in-charge. Engraved plastic labels shall be provided indicating the feeder details, and capacity and danger signs.

6.2 The boards shall accommodate air insulated bus bars, air circuit breakers, switch fuse units with HRC fuses, starters, necessary meters, relays, contactors etc. as required and arranged in suitable tiers.

6.3 The switchboard shall be fully compartmentalized in vertical tiers housing the feeder switches in totally enclosed department. Each compartment shall be self sufficient with switch unit, fuses, contactors, relays, indicating lamps and an interlocked door with facility for pad-locking. Each feeder must terminate in an independent labeled terminal block. Strip type terminal block accommodating several feeders together is not acceptable.

Pressure clamp type terminals suitable for relevant aluminum wires may be used upto switches of 25 A and cable lugs for higher ratings. All termination shall be shrouded in an approved manner. The entire enclosure shall meet with relevant IS:2147/1962. Feeder connections shall be of solid insulated copper/aluminum wires or strips with bimetallic clamps wherever required. Internal wiring, bus bar markings etc. shall conform to IS:375/1963. Internal wiring shall have terminal ferrules. Main switch should be at an easily accessible height and the highest switch operating handle should not be over 1.75 m. from floor level. Cable glands need not form part of the switch board as the cost of glands will form part of the cable termination.

6.4 The panel shall be fabricated in enclosure of not more than 1 mt. The panel shall be assembled at site.

7.0 BUSBARS :

7.1 Bus bars shall be three phase and neutral and of Tinned Electrolytic copper/ aluminum or aluminum as described in the Schedule of work. Alloy rated for a temperature rise of 30°C over the ambient

Client ID	35
Tender No.	1107
Page No.	70/93

temperature specified, based on insulated conductor rating (IS:8084-1976). Neutral bars may be of one half the size of the phase bars. The main horizontal bus bars shall be of uniform cross section and rated in accordance with the incoming switch. The vertical bus bars for the feeder columns may be rated at 75% of aggregate feeder capacity and shall be uniform in size. Bus bars and interconnections shall be taped with PVC colour coded tape to prevent bar-to-bar accidental shorts. Each bus bar shall be directly and easily accessible on removal of the front cover. Bus bars shall be totally enclosed, shrouded and supported on non-hygroscopic insulator blocks to withstand thermal and dynamic overloads during system short circuits. An earth bus of size 50% of the phase subject to the following maximum and minimum shall be provided. Individual switch components shall be connected with the earth bus through copper strip size of connecting wire being as above. All wire connections to bars shall be through lugs, bolts and nuts and spring washers.

CopperAluminum	Galvanized Steel		
Minimum	6.5 Sq.mm.	10 Sq.mm	20 Sq.mm
Maximum	65 sq. mm.	120 sq.mm.	200 sq mm.

The minimum size of earth bar in a board shall however be 25 x 3 Al. or equivalent.

8.0 ISOLATORS :

- 8.1 Isolators shall be fixed on wall on self-supported angle iron framework as required and mounted as near to the motor as possible. Where several motors are installed, isolators if required shall be provided at a central location on a common framework.
- 8.2 Painting, earthing and labels shall be provided, as generally, indicating for MV Switch gear and as shown on drawings.

9.0 EARTHING:

- 9.1 All switch panels shall be provided with an earth bar as specified. Earthing of the switch boards shall be through the equipment earthing system provided in the building. All meters shall be calibrated and tested through secondary injection tests. All field tests shall be witnessed by Engineer-in-charge and recorded.

10.0 INSTALLATION:

- 10.1 All panels shall be supported on MS channels incorporated in the panel during the fabrication. All such supports shall be prime coated with two finish coats. After completion of the work all panels shall be touched up for the painting, if damaged.
- 10.2 All panels shall be megged phase and to neutral using a 1000 V. meggar with all outgoing feeders in closed position. The meggar value should not be less than 2.5 megohms between phases and 1.5 megohms between phases and neutral.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	71/93

10.3 Fabrication drawings of all panels shall be approved by the Engineer-in-charge before fabrication.

11.0 TESTING & INSPECTION:

11.1 All switchboards shall be factory inspected before finishing and dispatch.

11.2 Certificate for all routine and type tests for circuit breakers in accordance with the IS:2516- 1963 shall be furnished. In addition, all panels shall be megged, phase to phase, and phase to neutral, using a 1000 V meggar with all switch gear in closed position. The meggar value should not be less than 2.5 megohms between phases and 1.5 megohms between phase and neutral.

11.3 Earthing of the panels from the equipment earthing system will be paid for unit rates separately as specified under earthing or as specified in BOQ.

12.0 MODE OF MEASUREMENT :

12.1 Panels, isolators will each be considered as one unit for the purposed of measurement and shall include the following :

- i) Incoming and Outgoing feeder terminals.
- ii) Interconnections and controls and instrument wiring with necessary protective fuses.
- iii) Meters, Relays, Indicating lamps, CT's control fuses etc.
- iv) Supporting structure, sheet steel enclosure.
- v) Installation and testing.

Earthing of the Panel/Isolator from the equipment earthing system will be measured separately at the said unit rates.

DISTRIBUTION BOARDS

1.0 SCOPE :

1.1 The scope of work shall cover the supply, installation, testing and commissioning of lighting and power distribution boards. Associated minor civil work required for the erection of the DB's are also included in the scope of this contract.

2.0 DISTRIBUTION BOARDS:

Distribution boards along with the controlling MCB's/Fuse or Isolator as shown shall be fixed in an M.S. Box with hinged lockable door suitable for recessed mounting in wall. Distribution boards shall be made of 14 SWG steel sheet duly rust inhibited through a process of de-greasing, acid pickling, phosphating and powder coated to an approved colour of adequate micron rating duly approved by the Engineer-in-charge.

Three phase boards shall have phase barriers and a wire channel on three sides generally as shown on drawings. Neutral bars shall be solid tinned copper bars with tapped holes and chase headed screws. For 3 phase DB's, 3 mm. independent neutral bars shall be provided. All DB's shall be internally pre-

Client ID	35
Tender No.	1107
Page No.	72/93

wired using copper insulated PVC wires brought to a terminal strip of appropriate rating for outgoing feeders.

- 3.0 Conduit knockouts shall be provided as required/shown on drawings and the entire board shall be rendered dust and vermin proof with necessary sealing gaskets. The top and bottom side of DB should be detachable.
- 3.1 MCB's shall have quick make and break non-welding self-wiping silver alloy contacts for 9 KA/3 KA short circuit both on the manual and automatic operation. Each pole of the breaker shall be provided with inverse time thermal over load and instantaneous over current tripping elements, with trip-free mechanism. In case of multi-pole breakers, the tripping must be on all the poles and operating handle shall be common. Breakers must conform to BS 3871 with facility for locking in OFF position. Pressure clamp terminals for stranded/solid conductor insertion are acceptable upto 4 sq.mm. aluminum or 2.5 sq.mm. copper and for higher ratings, the terminals shall be suitably shrouded. Wherever MCB isolators are specified they are without the tripping elements.
- 3.2 Fuses shall be HRC link type re-wireable with necessary fuse carriers and with rating of not less than 25 MVA. Bottle type fuses are not acceptable. Fuse carrier terminals shall be suitably shrouded. Re-wireable fuse carriers shall be porcelain. HRC fuses for motor duty should be time lag type.
- 3.3 Distribution boards shall have HRC/re-wireable fuses as shown on the schedule and drawings. Board shall meet with the requirements of IS 2675 and marking arrangement of busbars shall be in accordance with I.S. standards.
Bus bars shall be suitable for the incoming switch rating and sized for a temperature rise of 35° C over the ambient. Each board shall have two separate earthing terminals. Circuit diagram indicating the load distribution shall be pasted on the inside of the DB. One earthing terminal for single phase and two terminals for 3 phase DB's shall be provided with an earth strip connecting the studs and the outgoing ECU earth bar.
- 3.4 In the case of MCB distribution boards, the backup fuses wherever shown shall be not less than 63 A with a delayed characteristic and a minimum pre-arcing time of 0.5 sec. at 9 KA/3 KA fault current.
- 3.5 All outgoing feeders shall terminate on a terminal strip which in turn is interconnected to the MCB/Fuse base by means of insulated single conductor copper wires as follows :

Upto 15 A	2.5 sq.mm.	40 A	10 sq.mm.
25 A	4.0 sq.mm.	63 A	16 sq.mm.
32 A	6.0 sq.mm.		

- 3.6 Each DB shall have indicating lamps preferably neon type denoting power availability in the board after the switch indicating lamps shall be complete with fuses.

4.0 RCA/ MCB :

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	73/93

- 4.1 The RCA should suffices all the requirements of IS as per code IS - 12640 - 1988. The RCA should be current operated and not on line voltage.
The RCA should ensure mainly the following functions.
a) Measurement of the fault current value.
b) Comparison of the fault current with a reference value.
- 4.2 The RCA should have a torroidal transformer witch has the main conductors of primary (P - N) which check the sum of the current close to zero.
- 4.3 All metal parts should be inherently resistant to corrosion and treated to make them corrosion resistant.
- 4.4 It should be truly current operated.
- 4.5 It should operate on core balance torroidal transformer.
- 4.6 It's accuracy should be $\pm 5 \%$.
- 4.7 It should operate even in case of neutral failure.
- 4.8 It should trip at a present leakage current within 30 M.S.
- 4.9 It's enclosure should be as per IP 30.
- 4.10 It's mechanical operation life should be more than 20,000 operations.
- 4.11 It should provide full protection as envisaged by IE rules - 61-A, 71 - ee, 73 - ee, 1985 and also rule 50 of IE rule 1956.
- 4.12 It should conform to all national and international standards like IS 8828 : 1993, IS 12640 - 1988, BS 4293 - 1983, CEE 27 (International commission Rules for the approved of electrical equipment).

5.0 LIGHT CONTROL DIMMERS :

- 5.1 Dimmers shall be solid state semiconductor devices silicon controlled rectifiers or Thyristers in modular construction. Input and output switches shall be as specified. Stability shall be maintained and lamps shall not flicker due to aging of the dimmer.
- 5.2 Dimmers shall be conservatively rated for continuous trouble free operation and shall be suitable for system voltage of 230 to 280 V single phase and a momentary surge voltage of 440 V. Each dimmer shall have a rotary 3 position switch for OFF, BYPASS and through connection.
- 5.3 Each Dimmer shall be protected for overload and short circuit through suitable MCB's. Each Dimmer shall have individual sliding type control together with a master controller for 3 phase Dimmers.

Client ID	35
Tender No.	1107
Page No.	74/93

5.4 Wherever Dimmers are specified, the size of the DB/switch board shall be suitably enhanced.

6.0 INSTALLATION & TESTING :

6.1 All distribution boards shall be mounted on wall or recessed with necessary angle iron frame work. All mounting frames shall be prime coated with two finish coats after the completion of the work. All distribution boards shall be touched up for damaged painting.

6.2 All boards shall be tested with megger phase to phase and to neutral using 1000 V megger with all switchgear in closed position. The megger value should not be less than 2.5 megohms between phases and 1.5 megohms between phase and neutral.

6.3 Fabrication drawings of all boards shall be approved by the Engineer-in-charge before fabrication and the boards inspected before despatch. The contractor to ensure this for release of payments.

7.0 MODE OF MEASUREMENT :

7.1 The distribution board complete with the various components specified, erection etc., will be treated as one unit for the purpose of measurement and payment.

7.2 DB's with dimmers shall be separately counted.

MEDIUM VOLTAGE CABLING

1.0 SCOPE :

1.1 The scope of work shall cover supply, laying, connecting, testing and commissioning of low and medium voltage power and control cabling.

2.0 CABLES :

All cables shall be 1100 Volt grade PVC insulated, sheathed with or without steel armoring as specified and with an outer PVC protective sheath. Cables shall have high conductivity stranded aluminum or copper conductors and cores colour coded to the Indian Standards.

3.0 All cables shall be new without any kind or visible damage. The manufacturers name, insulating material, conductor size and voltage class shall be marked on the surface of the cable at every 600 mm centers.

4.0 INSTALLATION

4.1 Cables shall be laid in the routes marked in the drawings. Where the route is not marked, the contractor shall mark it out on the drawings and also on the site and

Client ID	35
Tender No.	1107
Page No.	75/93

obtain the approval of the Engineer-in-Charge before laying the cable. Procurement of cables shall be on the basis of actual site measurements and the quantities shown in the schedule of work shall be regarded as a guide only.

- 4.2 Cables, running indoors shall be laid on walls, ceiling, inside shafts or trenches. Single cables laid shall be fixed directly to walls or ceiling and supported at not more than 500 mm. Where number of cables are run, necessary perforated cable trays shall be provided wherever shown. Perforated trays shall be mild steel or Aluminum as specified in the schedule of work and supported on mild steel frame work as shown on drawings or as approved. Cables laid in built-up trenches shall be on steel supports. Plastic identification tags shall be provided at every 30 m.
- 4.3 Cables shall be bent to a radius not less than 12 (twelve) times the overall diameter of the cable or in accordance with the manufacturer's recommendations whichever is higher.
- 4.4 In the case of cables buried directly in ground, the cable route shall be parallel or perpendicular to roadways, walls etc. Cables shall be laid on an excavated, graded trench, over a sand or soft earth cushion to provide protection against abrasion. Cables shall be protected with brick or cement tiles on all the three sides as shown on drawings. Width of excavated trenches shall be as per drawings. Back fill over buried cables shall be with a minimum earth cover of 750 mm to 1000 mm. The cables shall be provided with cables markers at every 20 meters and at all loop points.
- 4.5 The general arrangement of cable laying is shown on drawings or may be obtained from Engineer-in-Charge. All cables shall be full runs from panel to panel without any joints or splices. Cables shall be identified at end termination indicating the feeder number and the Panel/Distribution board from where it is being laid. Cable termination for conductors upto 4 sq.mm. may be insertion type and all higher sizes shall have tinned copper compression lugs. Cable termination shall have necessary brass glands. The end termination shall be insulated with a minimum of six half-lapped layers of PVC tape. Cable armoring shall be earthed at both ends.
- 4.6 In case of cables entering the buildings. It would be done duly only through pipes. The pipes shall be laid in slant position. So, that no rain water may enter the building. After the cables are tested. The pipes shall be sealed with M. seal & then tarpaulin shall be wrapped around the cable for making the entry of water light.
- 4.7 All cables shall be provided with stainless steel/Aluminum cable identification tags at a maximum distance of 10 m.

5.0 TESTING:

- 5.1 MV cables shall be tested upon installation with a 500 V Meggar and the following readings established:
- 1) Continuity on all phases.
 - 2) Insulation Resistance.
(a) between conductors.

Client ID	35
Tender No.	1107
Page No.	76/93

(b) all conductors and ground.

All test readings shall be recorded and shall form part of the completion documentation.

6.0 MODE OF MEASUREMENT :

6.1 Cables will be measured on the basis of a common rate per unit length indoor or outdoor and shall include the following :

For cables laid indoors :

- i) Cables and clamps.
- ii) Installation, commissioning and testing.
- iii) Cable marking.

OR

For cable buried underground :

- i) Cables and protective bricks & tiles.
- ii) Installation, commissioning & testing.
- iii) Cable markers.

6.2 Cable trays/racks will be measured on the basis of unit length for individual sizes and shall include :

- i) Perforated trays on M.S framing ladder wall support or ceiling suspenders.
- ii) Installation and painting in 2 coats of black bituminous paint.

6.3 Each cable termination will be measured as one unit for payment. Certain cable sizes are grouped together and rates shall be furnished against each group. The item shall include the following :

- i) Cable glands, lugs, bolts, nuts.
- ii) All jointing materials.
- iii) Installations, testing and commissioning.
- iv) Earthing the glands.

6.4 For cables buried under ground excavation shall be paid for, in addition, for the following per unit volume:

- i) Excavation and back filling.
- ii) 6" Soft Earth Cushioning below and above cable.
- iii) Bricks on all the three sides of cable as shown in drawing/instructed by the Engineer-in-Charge.

CONDUIT WIRING

1.0 SCOPE :

The scope of work shall cover supply, installation testing and commissioning of all PVC conduit wiring

2.0 RIGID AND FLEXIBLE CONDUITS :

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	77/93

All conduits shall be done in concealed manner with rigid PVC pipe having minimum wall thickness of medium gauge 1.6 to 1.8 approved by F.I.A. & I.S.I. 25 mm. diameter for circuit mains with 2.5 sq. mm. EC grade.

- a) Upto 38 mm. diameter - minimum 1.8 mm. wall thickness.
- b) Above 40 mm. diameter - minimum 2.2 mm. wall thickness.

3.0 Flexible conduits shall be formed from a continuous length of spirally wound interlocked steel strip with a fused zinc coating on both sides. The conduit shall be terminated in brass adapters.

4.0 ACCESSORIES :

PVC conduit fittings such as bends, elbows, reducers, chase nipples, split couplings, plugs etc. shall be specifically designed and manufactured for their particular application. All conduit fittings shall conform to IS:2667-1964 and IS:3887-1966. All fitting associated with galvanized conduit shall also be galvanized.

5.0 WIRES :

5.1 All wires shall be single core multi-strand/ flexible copper or single strand Aluminium/Copper, PVC insulated as per IS:694 and shall be 660 V\1100 V grade.

5.2 All wires shall be colour coded as follows :

<u>Phase</u>	<u>Colour of wire</u>
R	Red
Y	Yellow
B	Blue
N	Black
Earth	Green (insulated)
Control (If any)	Grey
All off wires	Same as Phase wire

5.3 Colour code should be strictly used for all wiring.

6.0 SWITCHES & SOCKETS :

6.1 Switches shall be moulded plate type flush piano type with silver-coated contacts. Sockets shall be 3 pin with switch and plate type cover. Combination of multiple switch units and sockets should be used to minimize the switch boxes.

6.2 For heavy duty, metal clad sockets with M.C.B/ Isolator mounted in a galvanized steel box shall be provided.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	78/93

7.0 INSTALLATION :

7.1 The size of conduit shall be selected in accordance with the number of wires permitted under table given below. The minimum size of the conduit shall be 25 mm. diameter unless otherwise indicated or approved. Size of wires shall not be less than 1.0 sq.mm. copper or 2.5 sq.mm. aluminium.

Nominal dia. of wires (mm.)	Nominal Cross sec. area (mm ²)	20 mm		25 mm		32 mm		38 mm	
		S	B	S	B	S	B	S	B
1/2.40	1.50	4	3	8	6	15	9	-	-
1/1.80	2.50	4	2	6	4	10	8	-	-
1/2.24	4.00	2	2	4	3	8	6	-	-
1/2.80	6.00	1	-	4	3	6	6	-	-
1/3.55	10.00	1	-	3	2	5	4	6	5

S - runs of conduits which have distance not exceeding 4.25 m. between draw boxes & which do not deflect from the straight by an angle more than 15 degree.

B - runs of conduits which deflect from the straight by more than 15°.

7.2 Conduits shall be kept at a minimum distance of 100 mm. from the pipes of other non-electrical services. And maintain minimum 300 mm distance between telephone, TV & Computer piping.

7.3 Separate conduits/raceways shall be used for :

1. Normal lights and 5 A 3 pin sockets on lighting circuit.
2. Separate conduit shall be laid from D.B. to switch board or point.
3. Power outlets - 15 A 3 pin 20 A/30 A, 2 pin scraping earth metal clad sockets.
4. Emergency lighting.
5. Telephones.
6. Fire alarm system.
7. Public address system & Music system.
8. For all other voltages higher or lower than 230 V.
9. T.V. Antenna.
10. Water level guard.
11. Computer Wiring

7.4 Call bell wiring layout of conduits shall be generally as indicated on drawings and the layout shall be supplemented and complemented by contractor on site with the approval of the Engineer.

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	79/93

- 7.5 Wiring for short extensions to outlets in hung ceiling or to vibrating equipment's, motors etc., shall be installed in flexible conduits. Otherwise rigid conduits shall be used. No flexible extension shall exceed 1.25 m.
- 7.6 Conduits run on surfaces shall be supported on metal 12 mm. thick saddles which in turn are properly screwed to the wall or ceiling. Saddles shall be at intervals of not more than 500 mm. Fixing screws shall be with round or cheese head and of rust-proof materials. Exposed conduits shall be neatly run parallel or at right angles to the walls of the building. Unseemly conduit bends and offsets shall be avoided by using fabricated mild steel junction/pull through boxes for better appearances. No cross-over of conduits shall be allowed unless it is necessary and entire conduit installation shall be clean and neat in appearance.
- 7.7 Conduits embedded into the walls shall be fixed by means of staples at not more than 500 mm. intervals. Chases in the walls shall be neatly made and refilled after laying the conduit and brought to the finish of the wall.
- 7.8 Conduits buried in concrete structure shall be put in position and securely fastened to the reinforcement and got approved by the Engineer, before the concrete is poured. Proper care shall be taken to ensure that the conduits are neither dislocated nor choked at the time of pouring the concrete suitable fish wires shall be drawn in all conduits before they are embedded. Where conduit passes through expansion joints in the building, adequate expansion fittings shall be used to take care of any relative movement.
- 7.9 Inspection boxes shall be provided for periodical inspection to facilitate withdrawal and removal of wires. Such inspection boxes shall be flush with the wall or ceiling in the case of concealed conduits. Inspection boxes shall be spaced at not more than 12 meters apart or two 90° solid bends or equal. All junction and switch boxes shall be covered by 6 mm. clear perspex plate truly cut and fixed with cadmium plated brass screws. These junction boxes shall form part of point wiring or conduit wiring as the case may be including the cost of removing the perspex cover for painting and re-fixing. No separate charges shall be allowed except where specially mentioned.
- 7.10 Conduits shall be free from sharp edges and burrs and the threading free from grease or oil. The entire system of conduits must be completely installed and rendered electrically continuous before the conductors are pulled in. Conduits should terminate in junction boxes of not less than 32 mm. deep.
- 7.11 An insulated earth wire of copper rated capacity shall be run in each conduit.

8.0 LIGHTING & POWER WIRING:

- 8.1 All final branch circuits for lighting and appliances shall be single conductor cables run inside conduits. The conduit shall be properly connected or jointed into sockets, bends, junction boxes.
- 8.2 Branch circuit conductor sizes shall be as shown in the schedule of quantities and or drawings.

Client ID	35
Tender No.	1107
Page No.	80/93

- 8.3 All circuits shall preferably be kept in a separate conduit upto the Distribution Board. No other wiring shall be bunched in the same conduit except those belonging to the same phase. Each lighting branch circuit shall not have more than ten outlets or 800 watts whichever is lower. Each conduit shall not hold more than three branch circuits.
- 8.4 Flexible cords for connection to appliances, fans and pendants shall be 650/1100 V grade (three or four cores i.e with insulated neutral wire of same size) with tinned stranded copper wires, insulated, twisted and sheathed with strengthening cord. Colour of sheath shall be subject to the Engineer-in-charge's approval.
- 8.5 Looping system of wiring shall be used. Wires shall not be jointed. Where joints are unavoidable, they shall be made through approved mechanical connectors. No such joints shall be made unless the length of the sub-circuit, sub-main or main is more than the length of the standard coil.
- 8.6 Control switches shall be connected in the phase conductors only and shall be 'ON' when knob is down. Switches shall be fixed in 3 mm. thick painted or galvanized steel boxes with cover plates as specified. Cadmium plated brass screws shall be used.
- 8.7 Power wiring shall be distinctly separate from lighting wiring. Conduits not less than 25 mm. and wires not less than 2.5 sq.mm. copper shall be used.
- 8.8 Every conductor shall be provided with identification ferrules at both ends matching the drawings.
- 8.9 All light fittings should be supported from the R.C.C ceiling with the help of chains or downrods.**
- 9.0 TESTING :**
- 9.1 The entire installation shall be tested for :
- Insulation resistance.
 - Earth continuity.
 - Polarity of single pole switches.
- A test certificate shall be submitted in the proforma shown under Appendix - I.

10.0 Mode of measurement :

- 10.1 The definition of point wiring shall be in accordance with sketch drawing and should include wiring from D.B. onwards together with all junction boxes, connectors, earth wire, fixing accessories, connection to all light fittings switches etc. as specified and shown on drawings. The point rate shall include circuit wiring from distribution board to switch board and/or directly to the point.
- 10.2 All switches sockets with boxes, earthing interconnection and plate type silver contact switch shall be inclusive in point wiring.

Client ID	35
Tender No.	1107
Page No.	81/93

- 10.3 All empty conduit runs, including junction boxes fish wires etc. shall be paid on the basis of unit length. Measurements shall be along the conduit and concurrent length of sub-circuit wiring.
- 10.4 Buzzer indicator of the ways specified shall consist of indicating lamps, reset button, electromagnet, perspex cover plate, chromium plated brass screws etc. shall be considered as one unit for measurement and payment.
- 10.5 Two way light points shall be classified according to and consist of 2 Nos. 2 way plate type switches, wiring from the 1st 2 way switch to the 2nd 2 way switch to the first light controlled. Subsequent lights, if any, shall be measured as ordinary secondary point.

TELEPHONE DISTRIBUTION

1.0 SCOPE :

1.1 The scope of work shall cover supply, installation, commissioning and testing of :

- i) Telephone cables
- ii) Telephone Tag Blocks
- iii) Telephone wiring in conduits

1.2 The telephone exchange and the hand sets shall be supplied separately.

2.0 CONDUITS :

2.1 Conduits shall be as given below :

Indoor : medium gauge Rigid PVC conduit.

The conduit shall generally be as specified under section 'CONDUIT WIRING'.

3.0 CABLES AND WIRES :

3.1 The type of cables and the services shall be as follows :

- i) Indoor Multi pair, PVC insulated sheathed armored and sheathed.
- ii) Inside Twin core PVC insulated with conduit twisted cores.

3.2 All multi core cables and wires shall be of tinned copper conductor of not less than 0.5 mm dia and shall be colour coded twisted pairs with rip cord.

Client ID	35
Tender No.	1107
Page No.	82/93

- 3.3 The conductor resistance shall be less than 150 ohms per KM and the insulation resistance between the conductors not less than 50 megohms and the nominal capacitance of about 0.1 micro farad per kilometer.
- 3.4 Cables laid under ground or locations subject to dampness and flooding shall be filled with polyethylene compound and shall have sufficient protection against moisture and water ingress.
- 3.5 All armoring shall be of galvanized steel wires and protected against corrosion by an outer sheath of PVC in the case of indoor cables and polyethylene in the case of outdoor cables. Outer sheathing must be fire retarding and anti-termites.
- 3.6 All unarmoured single core cables and inner sheath of armored cables shall be provided with ripcord.
- 3.7 All single pair cables for final extension to the telephone outlet box shall be unarmoured tinned copper conductors of not less than 0.6 mm. diameter and shall be drawn in conduits. All telephone outlets shall consist of 2 A 2 pair polythene connector in G.I box with 6 mm perspex cover with beveled edges and chromium plated brass hardware.

4.0 TAG BLOCKS:

- 4.1 The telephone tag blocks shall be suitable for the multi core telephone cables and shall have two terminal blocks, cross connect type. All incoming and outgoing cables shall be terminated on separate terminal blocks and termination shall be silver soldered. The cross connecting jumpers shall be insulated wires of same diameter and screw connected.
- 4.2 The tag blocks shall be mounted inside fabricated sheet steel boxes with removable hinged covers and shall be fully accessible. The enclosure shall be painted with 2 coats of red oxide and stove enameled.

5.0 INSTALLATION:

- 5.1 The installation of conduits shall generally be as specified under section 'CONDUIT WIRING'.
- 5.2 All cables shall be on cable racks and neatly stitched together.
- 5.3 The connection at the tag blocks shall be silver soldered so as to achieve minimum contact resistance.
- 5.4 The final branch connections with single pair cables in conduits and the maximum number of cables in each conduit shall be as follows :

Conduit diameter inch mm.	Max. No. of cables
------------------------------	--------------------

3/4" 20	2 Nos. single pair
1" 25	6 Nos. single pair
1 1/4" 32	12 Nos. single pair

Client ID	35
Tender No.	1107
Page No.	83/93

1½" 40

18 Nos. single pair

6.0 MODE OF MEASUREMENT :

- 6.1 The main telephone cables shall include supply and laying of multi pair cables on ceiling/wall/on cable trays/racks including all supports and shall be measured and paid on running length basis. Cable trays/racks shall be paid for separately.
- 6.2 The multi pair tag blocks shall consist of two-telephone connector's strips, jumpered interconnections silver soldered enclosure etc. and shall be measured and paid as one unit.
- 6.3 The conduit wiring for telephone shall include single pair 0.6 diameter cable in heavy duty rigid, PVC conduits and shall include junction boxes, pull boxes, 2 pair 2 A connector in GI box, perspex cover etc. and shall from one point.

ADDITIONAL SPECIFICATIONS

Electrical Works

- A) The scope includes supply, installation, testing and commissioning of the following complete in all respects:
1. Point Wiring (UPS point & Raw point)
 2. Telephone Wiring
 3. Sub-main Cables
 4. Data Cabling

1.1 Conduit System

- a) All conduit shall be heavy duty PVC conduits. The conduit fittings shall be of the same material as conduits.
- b) No conduit shall be less than 19 mm dia.
- c) All unarmoured cables and wires shall run within the conduits from lighting distribution board to lighting fixtures, receptacles, etc. in concealed manner in the wall/above false ceiling/floor.
- d) Conduit support shall be provided at an interval of 750 mm for horizontal runs and 1000 mm for vertical runs.
- e) Conduits shall be clamped on to approved type spacer plates or brackets or saddles or U-belts. The spacer plates or brackets in turn shall be securely fixed.
- f) Embedded conduits shall be securely fixed in position to preclude any movement.
- g) Conduits shall be installed in such a way as to ensure against trapped condensation.
- h) For long conduit run, junction/pull boxes shall be provided at suitable intervals to facilitate wiring.

Client ID	35
Tender No.	1107
Page No.	84/93

- i) Conduits shall be securely fastened to junction boxes.
- j) Conduit lengths shall be joined by couplers.
- k) Bends shall have a minimum radius of four (4) times the conduit diameter. All bends shall be free of kinks, indentation or flattened surfaces. Heat shall not be applied in making any conduit bend. Separate bends may be used for this purpose.
- l) Conduits and fittings shall be properly protected during construction period against mechanical injury. Conduit ends shall be plugged or capped to prevent entry of foreign materials.
- m) After installation, the conduit shall be thoroughly cleaned before pulling in any wire.

1.2 Wiring

- a) Wiring shall be generally carried out by PVC insulated FRLS wires in conduits. All wires in a conduit shall be drawn simultaneously. No subsequent drawing is permissible.
- b) Wires shall not be pulled through more than two equivalent 90 deg. Bends in a single conduit run. Where required, suitable junction boxes shall be used.
- c) Wiring shall be spliced only at junction boxes with approved type terminal.
- d) For lighting fixtures, connection shall be teed off through junction box, so that the connection can be attended to without taking down the fixture.
- e) Maximum two wires can be terminated to each way of terminal connectors.
- f) Separate neutral wires shall be provided for each circuit.
- g) Wiring for lighting and power circuits (15A plugs) shall be carried out in separate conduits.
- h) The following size of wires shall be used for circuit wiring
 - Lighting ckts : 2.5 sq.mm. copper wires
 - Power ckts. : 6.0 sq.mm. copper wires
 - Sub main : 10.0 sq.mm. copper wires (4 Nos.)
- i) Each lighting circuit shall not possess more than 10 points or 800 watt whichever is more.
- j) Not more than two power points shall be looped in one power circuit.
- k) Colour coding to be followed as follows:

Phase : Red, yellow, blue

Neutral: Black

Earth : Green

Separate colour coding to be used for convenience power and UPS power outlets.

- l) For telephone wiring – brown colour
 - Data cabling -- Grey colour
 - Music system -- white colour
 - Fire alarm -- Orange

1.3 Switches and Sockets

All switches and sockets shall be modular type, recessed in wall in matching

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	85/93

boxes (same manufacture).

1.4 Wires

All wires shall be 1100 Volts grade, copper conductor, multistrand (preferably in unitary construction) PVC insulated conforming to IS 694. The wires shall possess manufacturers trade mark and meter mark at every meter for convenience and control of usage. Colour coding for phase and neutral wire shall be observed.

Makes

Conduits : Precision

Wires (FRLS) : Finolex/National

Switches/Sockets : MK

+

2.0 Communication System

A) Telephone Sockets

Sockets to plug in telephone cables shall be of 2 pin/Telephone RJII type.

B) Telephone Cable

The telephone cable shall be 2 pair 0.6 mm dia tinned, high conductivity bunched copper conductor, twisted, PVC insulated, colour coded, PVC sheathed and unarmoured.

C) Telephone Wiring

Telephone wiring shall be carried out in separate heavy duty rigid PVC conduit for each socket concealed in wall/above false ceiling upto tag block located in server room. Colour coding for the telephone cable shall be brown.

D) Makes

Telephone Cable : Delton/NICCO.

3.0 Distribution Boards

Distribution board shall feed power to lighting and power circuits.

The units shall be wall recessed, powder coated type. MCB's shall only be visible on opening the door. The unit shall possess TPN MCB as incomer and each phase shall be provided with DP, 100 mA sensitivity earth leakage circuit breaker to ensure that due to tripping of any one ELCB the other phases remain healthy.

Outgoing MCB's shall possess 9 kA Interrupting capacity. Earthing studs shall be provided on either side of the board.

Make : MDS (Lexic).

Client ID	35
Tender No.	1107
Page No.	86/93

4.0 Cables

Cables shall be 1100 Volts grade, copper/aluminium conductor, PVC insulated, PVC sheathed unarmoured conforming to IS 1554. The cables shall be installed in PVC pipe of adequate size.

Makes

Cable : National/Finolex/Asian.

5.0 Earthing System

Earthing Conductors

- Generator : 25 x 3 mm GI strip
- Main Distribution Board : 8 SWG GI wire
- Servo Stabiliser : 25 x 3 mm GI strip
- Lighting Fixtures : 16 SWG copper wire
- 15 A Socket Outlets : 14 SWG copper wire

Earth pit shall be made embedding 38 mm dia GI pipe, 4.5 m long using alternate layer of salt and charcoal, masonry enclosure on top and funnel arrangement as per IS:3043.

6.0 Data Cabling

Data cabling shall comprise IO sockets, CAT 6 cabling, jackpanel, and communication rack of 9U capacity.

All data cabling sockets shall be connected to switch/hub using CAT6 cable of AVAYA – AT&T make.

Grey colour wire shall be used for data cabling.

All LAN sockets shall be connected to server using cat 6 cable.

Client ID	35
Tender No.	1107
Page No.	87/93

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

PART	DESCRIPTION	AMOUNT IN FIGURES (Rs.)
A	REPAIRIND WORK	
	GRAND TOTAL	Rs
	Rupees	
	(.....)	

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	88/93

**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 prevent entire furnitures & other asset belongs to Income Tax Department.
5. **If the premises flooring are completed at site, while carrying the furnishing work the entire flooring to be covered with necessary packing material ie POP on the Flooring, plastic sheet etc. If any flooring damaged by the contractor, the flooring need to be replaced by the contractor at his own cost. Failure to replace the existing flooring, UTITSL will replace the flooring through the other agencies and the cost will deducted from the Bill.**

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	89/93

PART 'A' REPAIRING WORK

Sr. no.	Description	Unit	Qty	Rate	Amount
1.	REPAIRING OF GYPSUM FALSE CEILING CEILING				
1.1	Providing , fixing and repairing of existing Gypsum false ceiling complete with painting. (Patch work)	Sq. Mtr.	8		
Mode of measurements : Sq. Mtr. Units: Sq. Meter. (Rupees.....only)					
2.	CLOSING OF WINDOW OPENING WITH FIBER SHEET				
2.1	Providing and fixing of 25 mm. x 25 mm. Aluminium frame to be fixed with the screws on the wall and fixing of the 2 mm. thk. Fiber sheet on the frame complete with ceiling the gap with white cement.	Sq. Mtr.	03		
Mode of measurements : Sq. Mtr. Units: Sq. Meter. (Rupees.....only)					
3.	RACEWAY INSTALLATION				
	Providing and fixing in position the following medium duty PVC conduits including all accessories such as bends, junction boxes, saddles, gitti and screw etc. concealed in False ceiling/wall/floor/open surface as required including PVC junctions or pull boxes with 3 mm. thick Perspex sheet cover plate complete				
3.1	25 mm. dia PVC conduit	RM.	150		
Mode of measurements : RM Units: Running Meter. (Rupees.....only)					
3.2	100 mm. wide PVC Channel	RM.	20		
Mode of measurements : RM Units: Running Meter. (Rupees.....only)					
3.3	Fabricating supplying at site of installation, 2.5 mm. thick sheet steel 5 sided junction boxes				

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	90/93

	height as per site condition and totally enclosed , seam welded. The channel and junction box shall be dust and water proof complete with suitable size SS Plate as required. 250 mm. x 250 x 50mm.(Height)	Nos.	02		
Mode of measurements : Counts.					
Units : Each (Rupees.....only)					
5.	WIRING FOR TELEPHONE,COMPUTER				
5.1	Supply and laying including numbering / ferruling of wire and continuity test for each cable of CAT-6 for Data in existing conduit.	RM.	900		
Mode of measurements: Running length to the nearest centimeter.					
Units : Running meter (Rupees.....only)					
5.2.	Supply and fixing of RJ 45 outlet with end to end terminations complete with G.I gang box if required, face plate, inner and outer plate as required.	Nos.	10		
Mode of measurements : Counts.					
Units : Each (Rupees.....only)					
5.3	Supply, Installation, Testing & Commissioning of 24 Jack Panel in existing Data Cabling Rack.	Nos.	01		
Mode of measurements : Counts.					
Units : Each (Rupees.....only)					
5.4	Supply Installation Testing & Commissioning of 12'' Exhaust Fan in toilet & pantry.	Nos.	02		
Mode of measurements : Counts.					
Units : Each (Rupees.....only)					

Contractor's Signature

Seal

Client ID	35
Tender No.	1107
Page No.	91/93

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**

Client ID	35
Tender No.	1107
Page No.	92/93

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.

Rates are 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 are inclusive of installation and commissioning of the work and free delivery of the material at the site

Date : _____

**SIGNATURE OF TENDERER
WITH RUBBER STAMP**

Client ID	35
Tender No.	1107
Page No.	93/93

Contractor's Signature

Seal