

**THE TRAVANCORE - COCHIN CHEMICALS LIMITED**

UDYOGAMANAL.P.O.  
KOCHI - 683 501



**GENERAL INFORMATION , CONDITIONS, SPECIFICATION ETC  
PERTAINS TO CIVIL WORK TENDERS.**

# THE TRAVANCORE - COCHIN CHEMICALS LIMITED

UDYOGAMANDAL P.O.

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## **General Information and Instructions to Tenderers**

**1. GENERAL INFORMATION :**

- 1.1 **Location :** Proposed Site is at Udyogamandal near Aluva in Kerala State; 20 Kms north of Cochin. Nearest Railway Station is Kalamassery in Southern Railway and the site is around 4 Kms from this station.
- 1.2 **Work Site :** Tenderers are requested to visit the site of work and get themselves acquainted with local site conditions before submitting the tender. No extra payment whatsoever will be made on this account.
- 1.3 **Climatic Conditions :** The climatic conditions are similar to those existing in Cochin, Kerala State.
- 1.4 Above information is given only as a preliminary idea and will not relieve the Contractor from his responsibility to satisfy himself of the site conditions and other relevant matters.

**2. INSTRUCTIONS TO TENDERERS :**

- 2.1 Tenderers should submit brief details of their past experience of similar types of work carried out by them in the form given.
- 2.2 Tenderer should submit with their tender list of equipment for this work in their possession which will be employed by them on this job.
- 2.3 If any clarification regarding specifications, conditions of contract etc. or schedule of quantities are required the same may be obtained by the tenderers from the office of the Chief Engineer (Civil), The Travancore Cochin Chemicals Limited, Udyogamandal - 683 501, Kerala.

## **General Direction**

1. In the event of the tender being submitted by the firm (Partnership) it must be signed separately by each member thereof, or in the event of the absence of any partner it must be signed on his behalf by the person holding a power of attorney to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act.
2. Receipts and payments made on account of a work then executed by a firm (Partnership) must also be signed by the several partners, excepts where the contractors are described in their tender as a firm, in which case the receipts must be signed in the name of firm by one of the partners, or by some other person having authority to give effectual receipts for the firm.
3. Any person who submits a tender shall fill up the usual prescribed form, stating at what rate he is willing to undertake each item of the work. The quantities shown therein are approximate only, being given as an indication of the scope of work to enable to tenderer to tender for the different portions of the work in accordance with his estimate of their cost, so that in the event of any increase or decrease in the quantity of any item of the work the actual quantities executed may be paid for at the rate stated for that particular item of work, subject only to any adjustments that maybe provided for in the General Conditions. It is to be clearly understood that no work will be paid for under more than once under any item.
  4. (a) The earnest money deposited by the Contractor with his tender will be retained by TCC as part of the Security Deposit for the due and faithful fulfillment of the contract by the contractor. To make up this Security Deposit which will be 5 % of the cost of work, the contractor will deposit within 15 days of the receipt by him of the notifications the acceptance of his tender in cash or in any other form acceptable to TCC as specified in tender notice endorsed in favour M/S Travancore Cochin Chemicals Limited
  - (b) If after the tender has been accepted the tenderer fails to pay the security deposit as Specified above, after written notice to him of any acceptance, the sum deposited by him as earnest money may be forfeited.
5. The owners inviting tenders shall have the right to reject all or any of the tenders, and will be not be bound to accept the lowest.
6. The company reserves the right to delete any item or part of the item of work without notifying the contractor and no compensation shall be payable to the contractor for the same.
7. TCC will not entertain any modifications /change in the conditions of contract & specifications and any contractor doing so will be at the risk of his tender being rejected summarily.

## General Conditions Of Contract

### DEFINITIONS :

In the contract (as hereinafter defined) the following words and expressions shall have the meanings hereby assigned to them except where the context otherwise requires:

- (a) "Employer" / "Owner" means Travancore - Cochin Chemicals Ltd., and its successors and as assignees.
  - (b) "Contractor" means the person or persons, firm or company whose tender has been accepted by the employer and includes the Contractor's personal representatives, Executors, Administrators, as assignees, successors and permitted assigns.
  - (c) "Engineer" means the Chief Engineer (Civil) or his nominee deputed in this behalf.
  - (d) The term 'work' or 'works' of the contractor shall mean all the various classes of work to be executed whether temporary or permanent, and includes all labour and materials, machineries, construction equipment, plant, operation and maintenance of tools and all other items required for the completion of the construction. It shall also mean the place of working where the context so indicates.
  - (e) "Contract" means the conditions of contract, specifications, drawings, priced bill of quantities, Schedule of rates and/or prices, if any, and tender.
  - (f) "Contract price" means the sum named in the tender subject to such additions thereto or deductions therefrom as may be under the provisions herein after contained.
  - (g) "construction Plant" means all machinery, tools, appliance of things of whatsoever nature required in or about the execution, completion or maintenance of the works or temporary works (as hereinafter defined) but does not include materials or other things intended to form or forming part of the permanent works.
  - (h) "Temporary Work" means all temporary works of every kind required in or about the execution, completion and maintenance of the works.
- 1, Contractor shall before the date fixed for commencement of work or notified otherwise execute an agreement in the form prescribed by Employer and shall pay for all stamps and legal expenses incidental thereto.
  2. The Contractor shall not assign or sublet this contract to any other person without the prior written approval of the Employer. The Contractor shall also not execute any power of attorney in favour of any person in respect of any matter touching this contract without the prior written approval of the Employer. Provided always that it shall be entirely within the discretion of employer either to grant such approval or to refuse it.
  3. The contractor shall execute all works in the most substantial and workmanlike manner and the material used shall be of the best quality and as specified and approved. The work shall be in perfect conformity with the drawings if any, which may be issued from time to time by the Company or their authorised nominee in this behalf.
  - 4.1 A technically qualified Engineer approved by Engineer shall be engaged by the contractor for the proper conduct of the work.
  - 4.2 The work under execution shall at all times be open to inspection and supervision of Engineer or his nominee and the contractor shall have always, whenever he is not himself present, and authorised responsible agent present at the work site during usual working hours (and at other times when reasonable notice of inspection by Engineer or his nominee to visit the work site has been given to the Contractor himself)

- 4.3 The appointment of an authorised agent and technically qualified engineer and change of agent or engineer shall be forthwith be notified by the contractor to the Engineer for his approval and such appointment shall not be valid unless approved by the Engineer in writing,
5. If the contractor makes a deviation from the specification, plan or direction without the previous approval in writing by Engineer or his nominee, such deviation and work will be considered as gratuitously done by the contractor shall at his own cost and expense, dismantle the same and reconstruct the work to this specification and directions given by the Engineer. However, Engineer may at his discretion, allow such work to stand (although it is not executed in strict accordance with the directions of Engineer) and pay such reduced rates as he may deem fit and fair provided always that this procedure is quite optional on his part.
6. The contractor is expected to have, inspected the site before tendering, and got a clear idea of the locality and the nature and extent of the works involved particularly for such items for which L.S. Rates are quoted. No claim will be entertained on the grounds of ignorance of the conditions under which the work shall have to be done.
7. The usual working hours will be from 8 A.M. to 5 P.M. the contractor shall not, without giving sufficient notice and obtaining written permission of the Engineer or his nominee carry out any work between sunset and sunrise or on Sundays or holidays.
8. It shall be the responsibility of the contractor to provide adequate tools and equipments and machinery needed to do the work efficiently and expeditiously.
9. Engineer shall have the power to make any alterations in the original designs, drawings or instructions that may appear to be necessary during the progress of work and the contractor is bound to carry out such alterations even if this results in any increase in the quantities of any of the agreed items or in any extra items. Where the alterations referred to above result in increase in the agreed quantities, such increase will be paid for at the rates agreed to for such items in the bill of quantities and where the alterations result in the carrying out of items of work not provided for in the bill of quantities such extra items will be paid for as per conditions set forth below:
  - (a) When the extra item of work carried out is so similar class of work for which a rate is available in the bill of quantities the rate for the extra item will be derived from the rate for similar class of work.
  - (b) When the extra item done does not fall under category referred to in (a) above, the rate for such item will be paid on the basis of the prevailing P.W.D. schedule of rates.
10. If the contractor becomes insolvent or otherwise becomes unable to carry out the work or if without the written consent of employer the contractor assigns or sublets his contract or executes a power of attorney or if in the opinion of Engineer, the Contractor in any manner delays the commencement of work or delays or neglects to finish the work within the time prescribed or to maintain the progress of work as laid down in the Schedule in that regard in this contract, Employer may forth with forfeit the security deposit and terminate this contract or take it over in whole or part and employ any other agency or agencies or do or continue and complete the work or get done directly by the engineer. The contractor shall also be liable to make good the loss or damages if any suffered by the employer on this account. The contractor shall have no claim for compensation for any loss that may occur from any materials he may have collected or engagements he may have entered into on account of this work and shall have to claim what ever to any saving or profit that may accrue to Employer on account of the arrangement.
11. In the event of termination of this contract in whole or in part as specified in clause 10 or under any other clause the contractor shall not in any manner hinder or prevent Engineer or any workmen engaged by Engineer from proceeding to complete the work and it shall be lawful for Engineer to take possession of all tools, plant, materials and stores (or any portion thereof) belonging to the Contractor at the place where the works are to be performed and pay for the same on account of the contract rates, or require the contractor to remove them from the premises. In the event of the contractor failing to remove the same Engineer may make arrangements to remove them at the contractor's expense or sell them by auction at the risk of the contractor and remit the proceeds thereof after adjusting against penalty damages and dues to company etc.

- 12 In the event of termination of contract as mentioned above or under any other clause the contractor shall not be entitled to recover or be paid any sum for any work actually performed under this contract unless and until the Engineer shall have certified the performance of such work and value there of. The contractor shall only be entitled to be paid the amount so certified after deducting the value of damages, if any caused to Employer and other recoveries as per the various clause of the contract.
- 13 The rates tendered by the contractor shall include cost of labour and all incidental charges such as marking, setting out, preparing templates and materials therefore temporary facilities, protective works, supervision, safety measures, cost and hire of tools, implements and equipments for clearing the site etc. and also cost of all materials and scaffolding and staging and Government Taxes and all other levies including those as per the labour laws in force, but excluding the cost of materials, if any which will be supplied by Employer free of cost as specified in or by this contract. No separate claim for increasing the rate due to fluctuations in the rate of labour, materials, freight, taxes etc. will be entertained at any stages due to any reason or due to delay in starting up the work or delay in completion of work from the side of T.C.C. LTD. or the contractor.
- 14.1 Employer shall supply to the contractor such materials like cement, M.S. Rods etc. mentioned in the Memorandum of departmental materials at Schedule 'A' at the rates and other terms and conditions mentioned therein and stipulated in the special conditions of contract accompanying the tender notice. Such materials shall be delivered at the Employer's store against proper authorisation and receipt and the contractor shall transport the same to the required site at his own cost unless otherwise specified. All surplus materials in good conditions shall be returned by the contractor to the stores and proper receipt obtained.
- 14.2 The contractor shall exercise utmost care and economy in the usage of such materials and shall be responsible if any such materials is used in excess of what is required as per data and as per MDS specification, unless such usage is certified by the Engineer or his nominee as a special necessity. All surplus materials including containers and cut - bits etc. shall be promptly returned to the stores and receipt obtained. But Cut-bits of M. S. rounds or Torsteel of less than two meters in length will not be accepted . 5% wastage will be allowed for M. S. rounds and Torsteel. 200% of issue rates fixed in the tender schedule for M. S. rounds and Torsteel and Cement or Market rate whichever is higher shall be recovered from the contractor for unaccounted cement and steel which are issued at free of cost or at costs recoverable basis.
- 14.3. In the case of urgency Engineer or his nominee, may if found necessary in the interest of the progress of the work procure and issue or cause to issue from stoke any material which was not originally proposed to be supplied. In such cases which are quite optional, on the part of Employer, the book cost of the material plus 40% to wards overhead charges shall be recovered from the contractor and the provisions governing the issue of material mentioned in clause, 14.4 below..... shall also be applicable mutatis mutandis.
- 14.4. In case the contractor fails to return the containers and surplus materials etc. as mentioned in the proceeding clauses, whether out of free issues or chargeable, recovery for such unreturned items shall be effected at stipulated price or the book value or the market price whichever is higher.
- 14.5. Wherever Employer has undertaken to supply materials, the contractor should use his materials only on the work unless expressly agreed to in writing by the Engineer. All materials supplied to the contractor shall remain the absolute property of Employer and shall not on any account be removed from the site of work or used for any purpose other than that for which they are issued. The materials shall at all times be open to inspection by the Engineer or his nominee.
- 14.6. The contractor should order his own arrangement to keep the materials safe and in good condition at the site.
- 14.7. The contractor shall maintain an account of the materials issued by Employer in a form satisfactory to the Engineer and shall if so required submit to the Engineer on the 5th of every month a consolidated statement showing receipt, consumption and balance of materials or whenever it is demanded by the engineer-in-charge.



15. All materials which the contractor is expected to supply shall be installed or used only after getting the approval of the Engineer or his nominee and Employer will compensate no less on account of the transport or any other incidental expenses, caused to the contractor because of the rejection of such materials. The contractor at the same time is bound to remove the rejected materials from site within such time as may be specified by the Engineer or his nominee
- 16.1. The contractor shall provide at his own cost all necessary safety measures required to protect the public (including any property or right ) as well as his workmen from accident arising out of and in consequence of the work under this contract and shall be bound to bear the expenses of defence of any action or legal proceeding that may be brought by any person for injury or loss or damages sustained owing to neglect of safety precautions and to pay damages and costs which may be awarded in consequence as per rules in force.
- 16.2 The contractor shall be responsible for the safety of all employees or workmen employed or engaged by him on or in connection with the work. He shall forthwith report to the Engineer accidents or injuries if any sustained by any worker giving full particulars about the injured person and shall make adequate arrangements for rendering all possible first aids to the victims of the accident.
- 16.3 The contractor shall also be liable for payment of all claims and damages , compensation or expenses payable as a result of any accident or injury sustained by the workmen employed, engaged or used by him in the execution of this contract and also which he is liable to pay according to the W.C. Act or any other allied Act or rule or common law. In case the employer is obliged to pay any compensation to any workmen employed by the Contractor as above in the execution of the work, the Employer shall recover from the contractor the amount so paid and shall be at liberty to recover such amount by deducting it from the Security Deposit or from any sum due to the contractor whether under these conditions or otherwise.
17. It shall also be the responsibility of the contractor to observe the provision of any other law like the ESI Act, E.P.F. Act, Payment of Wages Act, Minimum Wages Act, the Contract Labour (Abolition and Regulation) Act, etc. to the extent they are applicable to him in respect of the workmen engaged or employed by him in or for execution of the work as per this contract. The contractor shall indemnify Employer against any claim that may be made on the Employer for any obligation under the said Acts or any allied Act in respect of the Contractor's workmen and any amount which may be required to be paid by Employer under the said Acts shall be recovered from the contractor by deduction from the amounts due to him or by other means. He shall maintain all registers and records in so far as they apply to his workers under the above Acts.
18. Employer reserves the right to omit anyone or more items of work from the tender at any time without assigning any reasons whatsoever and the contractor shall not be entitled to any claim on this account. If for any reasons the employer orders that the work should not be commenced, shall be suspended or stopped before completion the contractor will be paid for the work actually done and intends actually supplied up to the date of stopping but the employer will be held in no way responsible for any further liability.
- 19.1 The contractor shall commence the work within 10 days, from the receipt of a written order from Employer or the signing of the agreement whichever is earlier.
- 19.2 The date fixed by Employer for the completion of any portion of the work and the work as a whole shall be strictly observed by the contractor and no extension of time shall ordinarily be allowed. If the contractor fails to complete the work in time, penalty shall be released from him at the rate fixed by T.C.C. The Engineer may however extend the period under extraordinary or special circumstances on such conditions as he may deem fit if in his opinion such extension of time is warranted; provide always that any such extension of time alone shall not warrant a review or revisions of agreed rates for any item of work.
- 20.1. On completion of the work the contractor shall clear away and remove from the site all construction plant, surplus materials, rubbish, debris and all temporary works of every kind and make the whole of the site and work neat and clean to the satisfaction of Engineer. If the completed work on any portion thereof is found to be defective in any respect such defects shall be rectified for satisfying the conditions of the contract.



Final payment in settlement of the account in respect of the work shall not be made until these and other obligations as per the contract are satisfied. Should the Contractor fail to clear the site or to rectify the defects as aforesaid within a reasonable time allowed by the Engineer such clearance and rectification shall be carried out by the Engineer at the risk and cost of the contractor.

- 20.2. Engineer shall determine the date on which the work shall be regarded as having been completed in all respects and shall, in support of his determination grant a certificate to the contractor.
- 21.1. No work will be paid for unless thoroughly good and fully in accordance with the specifications and should through inadvertence bad work be passed and paid for, it will nevertheless be perfectly competent for the Engineer or his nominee to strike the same out of the account at any future time and recover the value at any date previous to or at the time of final settlement of the account of the contractor as per this contract.
- 21.2. Part payment may be made to the contractor as specified and as read with the Tender conditions of contract, but such payments will be treated only as payments on account and not as the actual cost of the work done. Such payments shall be without prejudice to the final drawing up of Accounts and shall neither be considered or used as evidence of any fact stated in or to be inferred from such accounts nor to mean any particular quantity of work having been executed much less the manner of its execution being satisfactory. Payment for these items for which there are no tendered rates will be deferred till the final bill is prepared.
- 21.3. On satisfactory completion of work the contractor shall be paid according to the tender rates accepted by the Employer subject to the conditions for new/extra items of work as elaborated (in clause No.9 (a) and (b) above and deducting amounts, if any, paid to the contractor during the progress of work and such other amounts as may be recoverable from him as per this contract.
22. Claims for any disputed items should be lodged with the Engineer within 30 days from the date of disallowance failing which the claim shall be deemed to have been waived.
23. The contractor shall produce the following documents before the contract is awarded to him.
  - (a) Income Tax clearance certificate
  - (b) Sales Tax clearance certificateNo payment will be made to the contractor unless the above documents are produced.
24. The contractor shall keep a muster roll of all the labourers engaged by him at site noting their daily attendance and wages. Payment must be made to them at least once in a fortnight and the signature or thumb impression of the employee should be obtained. Such rolls shall be open for inspection and verification by Engineer or his nominee whenever found necessary (See also Clause 17).
25. The contractor shall be responsible for the maintenance of the structures constructed by him for a period of three months (or such other longer period as may be specified else - where in this contract) from the date of completion of works and any damage caused to the structure during this period due to construction faults will have to be rectified by the contractor at his own cost. The Security Deposit shall be released to the contractor only after completion of the maintenance period.
26. Quantities of work given in the schedule are only approximate and may vary widely. The contractor shall carry out any quantity of work in excess of the stated quantities in respect of the contract awarded at the same agreed rate/s. Substantial variation/deviation in specifications and design will however entail review / enhancement / reduction of the quoted agreed rates at the discretion of the Engineer.
- 27.1 The tenderer shall deposit as earnest money the amount as given in the tender notice. Tenders not accompanied by such deposits will not be considered. On the successful tenderer entering into an agreement this amount will be adjusted towards the Security required to be deposited. The earnest money of the unsuccessful tenders will be returned soon after the tenders are finally settled.
- 27.2. As Security for the due and proper performance of the contract, the contractor shall before entering into an agreement and within fourteen days of the communication of the acceptance of the tender deposit with Employer a sum which together with the earnest money already deposited make up a total of 5% (corrected

to the nearest hundred rupees) of the value of his tender assessed by the rates and quantities given in his tender or such other amount as may be specified with tender notice or special conditions of contract. In case the contractor fails to deposit the security deposit within the specified time, the letter of acceptance issued to him will stand cancelled and the earnest money already deposited by the contractor shall be forfeited without any further reference.

- 27.3. The earnest money deposit and the security deposit shall be paid by means of crossed Demand Draft on the State Bank of India, Cochin, State Bank of Travancore, Alwaye / Udyogamandal payable to T.C.C.Limited.
- 27.4. The amount of security deposit or any parts of such sums shall be applied by the Employer for releasing any dues for which the contractor may become liable under terms of this contract and the balance if any shall be returned to the contractor only after expiry of the maintenance period.
28. The contractor shall faithfully observe the security regulations of the company and any loss or damage incurred by the Company on account of the failure of the contractor or his employees to observe the security regulation of the company shall be made good by the contractor at his expense.
29. The Company's property if damaged due to careless handling of contractor or his employees should be repaired or replaced by the contractor ; failing which the cost thereof will be recovered from the contractor's bills.
30. The contractor will be permitted to put up temporary sheds in the site after approval by the Engineer. He must make his own arrangements for their construction and they should be dismantled and removed from the site as soon as the work is completed or earlier if instructed by the Engineer or his nominee to do so during the execution of work.
31. The contractor should make his own arrangements for the supply of power and water if required. See special conditions.
32. On all questions relating to interpretation of drawing, sketches or specifications and to the quality of workmanship and materials used on the work the Engineer's decision shall be final and conclusive. It should not be subject to arbitration and shall be binding on the contractor. No dispute on such matters will be entertained by the Employer except as provided in the special conditions.
33. Any legal proceeding related to this contract shall be limited to courts of law under the jurisdiction of the Kerala High Court.
34. Neither the contractor nor Employer shall be considered to be in default in the performance of their obligation herein if such performance is prevented or delayed for any cause beyond the reasonable control of the party affected, such as war hostilities, revolution, civil commotion, strike, epidemics, accident, fire, flood, earthquake or because of any law, order, proclamation, regulation or ordinance of any Government or sub - division thereof or because of any act of God.
35. All the conditions set-forth above and the schedule attached hereto and the other relevant documents relating to this contract are binding on the contractor unless repudiated by the contractor expressly in writing before commencing the work / conferment of this contract.
36. Having made myself / ourselves thoroughly acquainted with the above agreement and conditions thereof and understanding the terms, I / We hereby agree to conform thereto in all points severally and collectively.

Signature of the Contractor.....

## **Special Conditions of Contract**

These conditions are to be read in conjunction with the general conditions and in case of any variance from the general conditions the Special Conditions shall prevail

### **1. SECURITY DEPOSIT AND INTEREST**

The Security deposit for the work (vide clause 27.2 of the general conditions of contract) shall be 5% of the value of the tender.

### **2. SUPPLY AND APPROVAL OF DRAWINGS :**

2.1. Two sets of working drawings shall be supplied to the Contractor by the employer wherever applicable. Any amendments / revision incorporating additions to details and complementary details will also be issued from time to time at appropriate stage vide 4.4 also.

2.2. It shall be the responsibility of Contractor to prepare bar bending schedule, details drawing of windows, ventilators etc. Fabrication drawing of structural steel work, Shuttering and Form work at his own cost and shall construct the works according to such drawings after getting the approval of the Engineer.

2.3. All drawings and specifications, Instructions and directions and copies therefor furnished from time to time by the employer to the contractor shall be deemed and always be deemed to be the property of Employer and they shall not be used at any other work and with the exception of the signed set included in the contract documents shall be returned by the contractor to the Employer on completion of work or on termination of the contract.

2.4. The Contractor shall be responsible for the accuracy and correctness of the work executed by him including setting out, clearance to be given to the structures and other details given in the detailed drawings. Approval by the Employer of any other information supplied to the Contractor shall not in any way relieve the Contractor of the responsibility for accuracy and correctness of the work. If during progress of the work, any change or alteration in the design and drawings, is found necessary in the opinion of Employer or omission or inaccuracies are found, the contractor shall incorporate the additions / and / or / rectify the same, free of cost.

3.1. All materials used for the work must comply with the requirements or specifications laid down in the Tender form and other documents and must satisfy the tests and / or analysis etc. laid down in the specifications of the Indian Standard Institution or such other specifications as the Engineer may direct as being equivalent there to, together, in either case, with such additional tests and / or analysis as the Engineer may in any case order, or in the absence of such standards or specifications, with such requirements, tests and analysis as, in the opinion of the Engineer are fit and suitable. Cost of all such tests / analysis shall be borne by the Contractor.

3.2. Within 15 days of the awards of the contract, the Contractor shall send to the Engineer a complete schedule of cement and M. S. RODS required for the work with details as to when and in what quantities the materials are required by him so as to enable the Engineer to verify the requirements and arrange for the procurement of the materials in advance. He shall also give a programme of various activities connected with the work to ensure completion in time.

3.3. The contractor shall submit to the Engineer by the 5th of every month or as and when required a consolidated statement showing the receipts, consumption and balance of the materials issued to him both on chargeable basis as well as free issues for work.

### **4. FACILITIES FOR INSPECTION :**

4.1. The contractor shall afford the Engineer, and or his nominees and assistants every facility for entering in upon any portion of the work at all hours for inspection or for any other purpose and shall provide all materials, planks, ladders etc., required to facilitate the inspection.

- 4.2. The contractor shall give at least seven days notice in writing to the Engineer or assistants when ever any work or materials are intended to be covered up with earth in bodies or walls or otherwise to be placed beyond the reach of measurements so that the work may be inspected or the correct dimensions thereof may be taken before the work is so covered or placed beyond the reach of measurement. Where the contractor defaults to give such notice the same shall at the opinion of the Engineer and or their assistants be uncovered and measured at the expense of the contractor, or the alternative, no payments shall be made for such work or materials.
- 4.3. Should the Engineer or other person authorized in writing by Employer to supervised the work at any time consider it necessary for the purpose of enabling them to make any inspection or tests or analysis or to verify or ascertain the quality or strength of any part of the work or of any material, the Contractor shall if any when so required to do so by them or the persons authorised as aforesaid, open up the work of materials for inspection or testing or analyzing , or pull down or pull out the work into any number of parts and make such openings into, under or through any part of the work, as may be directed and provide all things, which, in the opinion of the Engineer or the persons authorised as aforesaid, may be necessary to enable the inspection or tests or analysis of the work or of any part thereof or of the materials or workmanship to be made and the Contractor shall close up, cover, rebuild and make good the whole at his own cost, as and when directed by, and to the satisfaction of the Engineer provided always that if the work, in the opinion of the Engineer is found to be satisfactory and in accordance with the contract, the expenses incurred by the Contractor for such examination, inspection or test, upon a certificate in this behalf by the Engineer be borne by the Employer.

5. **PROCEDURE FOR RECTIFICATION OF DEFECTS :**

If it shall appear to the Engineer at any time during the progress of the work or at any time prior to the expiry of the guarantee period of the work that any work has been executed with unsound, imperfect or unskillful workmanship or with materials of any inferior description or with any materials or articles provided by the Contractor for the execution of the work are unsound or of a quality, inferior to that contracted for the Contractor shall remove or reconstruct the work in whole or in part as may be referred, at his cost on demand in writing by the Engineer, rectify or replace the defective materials, within a reasonable time stipulated by the Engineer. If he fails to do so the Engineer may arrange for the rectification/reconstruction through other agencies and the extra cost so involved and the damages arising out of any consequent delay for completion of work shall be recoverable from the contractor.

6. If any work other than that included in the Contract is required to be executed at the site, the contractor shall have no right to be entrusted with the execution of the work which may be carried out by another contractor or contractors or by other means at the discretion of the Employer.
7. The Engineer shall have full powers to send persons upon the premises to execute fittings, other works etc. not included in the contract, for whose operations the Contractor shall afford every reasonable facility provided that such operations shall be carried out in such a manner as not to impede the progress of the work included in the contract, but the contractor shall not be responsible for any damage which may happen to or be occasioned by any such fittings or other works, provided he complies with the Engineer's instructions in connection therewith, and provided that the damage is not caused by himself or by his employees. The contractor shall, at all times, co-operate, assist, attend on, and afford facilities for such specialists as may be employed by the Engineer or other works, in connection with the work. The contractor shall also cause such special work or protect it as instructed to avoid injury during progress of the work. The failure to protect, the contractor must make good any damage caused. If any part of his work of the depends for proper execution upon, or results from the work of the other proper contractors the former shall inspect and promptly report to the Engineer any defect in the work of the latter likely to render it unsuitable for such proper execution and results. The failure of the Contractor entrusted with the work so to inspect and report shall, for all purposes, be deemed to constitute an affirmative approval of the work of the other contractors as being fit and proper for the receipt of his work, except as to defects which may develop in the work of the latter contractors after the execution of this work.



## **8. PRECAUTIONS DURING PROGRESS OF WORK**

- 8.1. The contractor shall be responsible to see that the level or other pegs, profits, bench marks, masonry pillars, or other marks set up by the Employer for guidance in the Execution of the work are not disturbed, removed or destroyed. If any such mark is, in the opinion of the Engineer found, disturbed, removed or destroyed, they will be replaced by the Employer at the cost of the Contractor.
- 8.2. During the execution of the work, the contractor shall at his own cost provide adequate materials for all works relating to shoring, timbering, strutting, scaffolding, etc. and execute the same in such a way as to ensure in abundant measure, the stability and safety of all structures, excavations and works, and further ensure that no physical injury or harm is likely to be caused to any property.
- 8.3. Existing roads or water courses shall not be blocked out through, altered, diverted or obstructed in any way by the Contractor save to the extent permitted by the Engineer. Any compensation claimed by the authorities concerned for any unauthorised closure, cutting through, alteration or diversion of obstruction to such roads or water courses by the contractor or his agent, or his staff shall be recoverable from the contractor.

## **9. BASIS FOR INTERIM PAYMENT**

- 9.1. Bills may be submitted by the contractor as soon as each stage of the work is completed and the Engineer shall take the requisite measure for having the same evaluated and the claim as far as admissible adjusted as far as possible.
- 9.2. From the 'on account' payment full deduction shall be made for all materials issued by the Employer and any other claim due from the Contractor. The contractor shall furnish along with each bill detailed measurements of all items involving the use of cement and M. S./Torsteel rods to enable the Employer to check and admit the issue of materials.

## **10. PAYMENTS WHEN ALTERATION ARE ENTERED**

No authorised variation shall violate the contract. Employer shall have the right to make any alteration in the original design during the progress of the work and the contractor shall be bound to carry them out.

## **11. FINAL BILL**

The final bill shall be prepared by the Engineer after the detailed measurements are taken by the Engineer or his nominee.

- 12.1. If it becomes necessary for the Contractor to replace or renew any defective portion of the work the provisions of this clause shall apply to the portion of the work so replaced or renewed until the expiration of three months from the date of such replacement or removal. If the defects are not remedied within a reasonable time, the Engineer may proceed to do remedy work at the Contractor's risk and expense, but without prejudice to any other right which Engineer may have against the contractor in respect of such defects.
- 12.2. All Inspection adjustments or renewals carried out by the Contractor during the guarantee period shall be subject to the same conditions of contract.

## **13. WATER AND POWER**

The contractor shall be given water and power necessary for the work free of cost at one point from the existing water supply system, provided the contractor shall at his own expense arrange to effect the connections and lay additional pipe lines and cables on the site and the contractor shall not be entitled to any compensation for any interruption or failure of power and water supply.

## **14. ESI SCHEME**

The Contractor should register all his workmen under ESI Scheme before commencement of the work and such payments as required under the ESI Scheme will be deducted from contractor's bills, as per the existing ESI rules or any amendments by law enforced.

15. In the event of any question, dispute or difference arising between the parties here to as to the construction or operation of this agreement or the respective rights and liabilities of parties, such question, dispute or difference shall be referred to the Chairman & Managing Director, for arbitration for decision as per provisions of the arbitration Act 1940 or any statutory modification or re-enactment thereof to such arbitration. Such decision shall be binding on both parties.
- 15.1 Progress of the work shall not be suspended or delayed on account of the reference to any dispute or difference to arbitration under clause 15. The decision of the Engineer on such dispute or difference shall be conclusive until reversed by the Arbitrator. Points of disputes or difference shall as far as possible, be resolved by the Arbitrator concurrently with the construction work in line with the spirit of the above provision. If the contractor abandons or neglects the work and fails to carry out any portion of work and get a completion certified as required under these contract conditions, he will not be free from any obligation to 'maintain' the work for 3 months. The Employer / Engineer will be at liberty to fix and define the date of physical completion of all works as per this contract in all respects and the period of maintenance irrespective of whether any dispute is raised for Arbitration under the Indian Arbitration Act 1940 for statutory amendments there of by the parties to the agreement. Such dates will be binding on the contractor.

## **General Specification For Civil Engineering Work :**

### **APPLICATION OF SPECIFICATIONS**

This specifications forms part of the Contract and shall be read in conjunction with other documents forming the contract, viz, the articles of agreement, General Conditions of Contract, General Direction for works, Special Conditions, Tender Form, Material Specifications, Schedule of Quantities.

### **WORK INCLUDED**

The rates for all items, unless specifically stated otherwise in the contract, must cover the cost of all materials, labour tools, machinery, plant, pumps, scaffolding, standing shores, props, bamboos, ropes, templates, pegs and all appliances and operations whatsoever necessary for efficient execution of the Work.

### **GROUND CONDITIONS**

The contractor as to visit the site and as certain local conditions traffic restrictions obstructions in the area and allow for extra likely to be included due to any official limitations whatsoever.

### **SETTING OUT AND LEVELLING**

The contractor is to set out and level the works, and will be responsible for the accuracy of the same. He is to provide all instruments and proper qualified staff required by the Engineer or his representatives for checking the Contractors work.

### **SAFETY CODE**

The contractor shall take adequate precaution to provide complete safety for prevention of accidents on the site.

The Engineer shall have power to cause the Contractor to adopt from time to time and such expedients or methods of carrying out the work as he may consider necessary to ensure the safety of the work people and accuracy of the work.

### **KEEPING WORKS FREE FROM WATER**

The contractor shall provide and maintain at his own cost or as per schedule electrically or other driver pumps and other plant and equipment to keep the site and / power foundation pits and trenches free from water and continue to do so till the work is completed to satisfaction of the Engineer.



### **RUBBISH, CLEANING AND HANDLING OVER**

The contractor shall clear away all rubbish, vegetation, roots, sods, etc. and dump them in the area indicated by the Engineer and to his satisfaction. No separate rate shall be allowed for the above.

After the work is completed and structures are handed over, the contractor shall clear the area surroundings the buildings of all bituments, temporary office, godown and excess store-sand remnants of building materials such as brick bats, metal, sand, timber, steel etc. at no extra cost to the Employer.

### **BENCH MARKS**

The contractor shall protect surveyor's bench marks zero line marks and base line marks from damage or movement during work.

### **INSPECTION**

The contractor shall inspect the site of work and ascertain site conditions and the nature of soil to be excavated.

### **CONTRACTOR'S STAFF**

The contractor shall provide at all times efficient, skilful and experienced staff capable of carrying out the work in accordance with the drawings and specifications and to correct levels. The cost of this establishment should be included in his rates.

### **EXECUTION OF WORKS**

The contractor is responsible for the correct execution of his work in accordance with the drawings provided to him and for all mistakes due to working to wrong levels or centre lines. When levels centre lines and bench marks have been once given to him by the Engineer it is his responsibility to record, protect and maintain the said marks, and to work to same, and no complaints can afterwards be attended to for excess work done in the consequence of such levels not having been kept up and maintained by himself.

### **METHOD OF MEASUREMENT**

Unless otherwise specified, the method of measurement for building works shall be as per IS: 1200.

### **SPECIFICATION REFERRED TO**

Unless specifically mentioned otherwise all the applicable codes and standards published by the Indian Standards Institution and all other standard which may be published by them before construction works starts, shall govern in respect of design, workmanship, quality and properties of materials method of testing. Some of the available standards are listed below. In absence of such standards the Engineer's decision shall be binding.

#### **IS : NO. GENERAL**

#### **DESCRIPTION**

IS: 1200

Method of Measurement of Building Works.

#### **CEMENT**

Specification for Ordinary, Rapid Hardening and low heat Portland Cement.

IS: 269

#### **SAND**

Specification for sand for plaster.

IS: 1542

Specification for Aggregate, coarse and Fine from natural sources for concrete.

#### **AGGREGATE**

Specification for natural and manufactured aggregate for use in mass concrete.

IS: 385

IS: 515

#### **CONCRETE PLAIN & REINFORCED**

Method of tests for Strength of Concrete.

IS: 516

Code of practice for plain and Reinforced concrete for General Building Construction.

IS: 456

<b>IS : NO. GENERAL</b>	<b>DESCRIPTION</b>
IS:432	Specifications for Mild Steel and medium tensible steel bars and Hard drawn steel wire for concrete Reinforcement
IS:1786	Specification for High Strength deformed bars for concrete reinforcement.
IS:1139	
IS:2502	Code practice for Bending and fixing of bars for concrete Reinforcement
 <b>BRICK WORKS</b>	
IS:1077	Specification for Common Burnt Clay Building Bricks.
IS:2212	Code of practice for Brick work.
 <b>PAVING &amp; FLOOR FINISHERS</b>	
IS:1237	Specification for cement concrete flooring tiles.
IS:1443	Code of practice for laying and finishing of cement concrete flooring tiles.
IS:2571	Code of practice for laying in site cement concrete flooring
 <b>PLASTERING AND PAINTING OF WALL</b>	
IS:1661	Code of practice cement and cement lime plaster finishes on walls and ceilings
 <b>ROOF COVERINGS</b>	
IS:459	Asbestos cement sheets, unreinforced corrugated
 <b>STEEL &amp; IRON WORK</b>	
IS:226	Specification for structural steel (Revised) standard quality.
IS:800	Code of practice for use of structural steel in general building construction in mild steel.
 <b>DOORS &amp; WINDOWS</b>	
IS:1003	Timber, panelled and glazed doors and windows.
IS:1038	Specification for steel doors, windows, and ventilators
IS:1609	Code of practice for laying damp proof of course using bitumastic felt.
IS:1346	Code of practice for Water proofing of roofs with bitumastic felts.
 <b>Scaffolding</b>	
IS:2750	1964 / IS 3696 : 1991 - Stability of the Scaffolding.

## Material Specification

Applicable provision of conditions of contract shall govern work under this section.

### 1. EARTH WORK AND EXCAVATION

#### 1.1 Scope of work :

The contractor shall furnish all labour, materials, tools equipment and necessary services to complete all, Excavation and backfill in accordance with the drawings and specified herein. Materials and work shall include but is not necessary limited to the followings :

- (a) **Excavation** : Excavate for all new foundations, footings, utility trenches, drivers, tracks, pits, drainage ditches etc. in fill, soft soil, and soft or hard murrum which can be removed by a pickaxe and in boulders less than ½ cft. sizes, and as specified in the schedule.
  - (b) **Fill and backfill** : Carry out all fill and back fill to complete subgrades, structures etc. All fill and backfill shall be uniformly compacted to the satisfaction of the Engineer and shall contain sufficient moisture to ensure maximum compaction density. If material from the excavation is not sufficient for the required fill or is unsatisfactory, the operator shall arrange for the obtain fill material from borrow areas shown by the Engineer and shall be of approved quality.
  - (c) **Control of water** : During excavation the control of surface, monsoon, subsoil and/or seepage water shall be the responsibility of the contractor and as specified in the schedule.
  - (d) **Shoring and Bracing** : The sides of all excavation for feet or more in depth shall be sloped to the slope as specified herein by the Engineer. The sides of excavation shall be shored and braced, if required by the Engineer to his satisfaction even though the sides of the excavation have been cut to the slopes specified.
- 1.2 **Control of seepage water** :The contractor shall furnish, install and operate all necessary machines, appliances and equipment all the times to keep the excavation free from water during construction and shall dispose off water as directed by the Engineer.
- 1.3 **Disposal of Excess Materials** :
- (a) The contractor shall dispose off the excavated materials and deleterious materials at disposal area as directed by the Engineer and spread in 6" layers neatly.
  - (b) Excavated material suitable for backfill may be stored temporary at site at location approved by the Engineer.
- 1.4 **Subgrade** : Subgrade shall carefully repaired to the required elevations. All excess excavation below the level of excavation permitted shall be filled back to grade with Lean Concrete (1:4:8) mix at Contractor's cost. Surface shall be kept clean and free from debris until finish of surfaces as specified elsewhere have been applied.
- 1.5 **Excavation for Structures** : Structure excavation shall be carried out to the depths shown in the drawings or as directed and to such widths as approved by the Engineer. If there are any slips or blows in the excavation they shall be removed by the contractor at his cost to provide correct dimensions required for foundations. All over excavation shall be backfilled to grade with Lean Concrete 1:4:8 at contractor's cost.
- 1.6 **Backfill** : All backfill around walls , footings, structures under floors etc, shall be placed in 8" layers and compacted to optimum moisture content. The backfilling operations shall not commence until permission has been granted by the Engineer.

**1.7 Definitions of type of Excavation :**

- (a) **Excavation in soil :** Soil excavation shall mean and include removal of all top soil, soft and hard murrum either by use of pavrahs, handshovels or pickaxes etc. as specified in the schedule.
- (b) **Excavation in soft rock :** Excavation in soft rock shall mean and include removal of all materials which cannot be removed by use of either pavrahs, handshovels or pickaxes and which need use of crow band and occasional drilling with pneumatic tools.
- (c) **Excavation in hard rock and boulder :** This shall mean and include removal of materials such as ledge rock and boulders over 2 Cft, size either by use of continuous drilling and / or blasting operations.

**1.8 Measurements for excavation of all types of starts :**

- (a) **Levels :** Excavation for foundations etc. shall have to be done to correct levels as shown on the relevant drawings or as directed by the Engineer. Any excavation done below specified level shall not be paid for and the contractor shall have to fill this extra excavation to correct level with concrete as specified at his own cost.
- (b) **Measurement for payments :** Payment for all excavations shall be made for actual quantity of work done under the item, limited to a maximum quantity as calculated from theoretical lines of excavation. Any excavation done by the contractor beyond the theoretical lines as specified shall not be paid for and back filling of such excess excavation beyond the theoretical lines shall be done by the Contractor at his own cost.

**10.9 Filling in with Murrum :** Murrum shall be hard and of approved colour. Only freshly quarried murrum shall be used on the works and in no case shall disintegrated material be used. On the cleaned site murrum shall be spread in 6" thick layers consolidated at optimum moisture content till full consolidation is attained by tamping or other approved means. The finished surface shall be levelled and shall follow the gradient or levels of the base of flooring. Flooding with water for consolidation will not be allowed.

**2. RUBBLE PACKING**

**2.1 Scope of Work :** The contractor shall furnish all labour materials, tools and services necessary to complete all 'Rubble packing' in accordance with the drawings and as specified herein.

**2.2 Materials :** The rubble stones shall be sound, hard and durable. They shall have at least one dimension equal to the thickness of rubble packing and shall in any case, not be less than 6" in any direction. The stones shall be carefully handpacked with longest side of each stone (which in no case shall be less than thickness of rubble packing) placed vertical with the smaller face of the two ends at the top. All interstices between stones shall be filled in solid with well driven stonechips and the surface shall be made uniform with stand. The surface shall be formed to such slopes as directed by the Engineer. The rubble packing shall be thoroughly consolidated and sprinkled with water, if required by the Engineer. The depth of rubble packing shall be taken as consolidated depth. The concrete for flooring shall be laid over rubble packing only after the Engineer issues the order to that effect.

**2.3 Measurement :** It shall be as per IS :1200.

**2.4 Brick Soling :** Where the soling is required to be provided it shall conform to the following specifications.

It shall be laid on edge, the bricks touching each other Soling shall be closely packed leaving no interstices or gaps. Appropriate Filler bricks be used to make up for dimensions which are part of whole brick. After the soling is complete the whole surface shall be subjected to consolidation by a light roller.

**3. CONCRETE WORK**

**3.1 Scope of work :** The contractor shall furnish all labour materials, tools, equipment and services necessary to complete all 'Concrete work' in accordance with the drawings and as specified herein.

Materials and work shall include, but it is not necessarily limited to, the following :

- (a) All foundations, footings and head walls.

- (b) All concrete piers beams, columns and walls, except where specifically excluded hereinafter.
- (c) Floor slabs, concrete platforms.
- (d) Miscellaneous concrete items such as sumps pits, ramps, equipment bases and manhole peds and covers.
- (e) Embedment in concrete of item furnished by others eg. angle frames, manhole, anchor bolts, electric conduit ducts and pipes etc.
- (f) All grouting as required.

**3.2 Materials :**

- (a) **Cement** : Shall be of an approved brand of ordinary setting domestic portland cement conforming to the latest I.S. Specification. All cement shall be fresh when delivered and free from lumps and otherwise undamaged. It shall be used directly from bags. Cement shall be stored in perfectly water tight well ventilated shed. The floor of the shed shall be at least 15 cm. above ground.
- (b) **Coarse Aggregate** :Shall be hard washed gravel or crushed stone or other approved inert materials, with similar characteristics, or combinations thereof, having clean hard, strong, durable, uncoated particles free from injurious amounts of soft, friable, thin elongated or laminated pieces, alkali, organic or other deleterious matter. It shall be washed if so decided by the Engineer. Aggregate shall be stored on platforms or otherwise as to avoid the inclusion of foreign materials. It shall be thoroughly wetted before being charges into the hopper of the mixer.

The grading shall conform to the following as far as possible.

**GRADING LIMITS FOR SINGLE SIZED COARSE AGGREGATE**

Nominal Size of Aggregate	80 mm	63 mm	40 mm	20 mm	12 mm	10 mm	No.480	No.240
63 mm	100	85-100	0.30	0.5	...	...	...	...
40 mm		100	85-100	0.20	...	0.5	...	...
20 mm		...	100	85-100	...	0.20	0.5	...
12 mm		...	...	100	85-100	0.45	0.10	...
10 mm	...	...	...	...	100	85-100	0.20	0.5

USE	SIZE
Slabs and walls 200 mm or more in thickness	40 mm to 10
mm Columns and girders with least dimensions under 300 mm or more	40 mm to 10 mm
Slabs and walls under 200 mm in thickness	20 mm to 10
mm columns and girders with least dimensions under 300 mm	20 mm to 10
mm	

Note :The sieve sizes of 80 mm, 63 mm, 40 mm, 20 mm, 12 mm and 10 mm will correspond roughly to B.S. sieve sizes of 3 in., 2 ½ in , 1½", ¾", and ⅜" respectively.

- (c) **Fine aggregate** shall consist of natural sand passing IS 480 sieve. Finest modules of sand used shall be between 2.6 and 2.80. Sand shall be sharp, coarse, clean and of approved quality and free from earth, dust or other impurities. Sand shall be washed and/or screened if required by the Engineer. The grading shall conform to the following as far as possible.

**GRADING LIMITS FOR FINE AGREEMENT (I.S. 383-1952)**

I.S. Sieve No.	Equivalent B.S. Sieve No.	Natural sand or Crushed Gravel sand	Crushed stone sand
480	3/16 in	95 - 100	90 - 100
240	7 in	70 - 95	60 - 90
120	14 in	45 - 85	40 - 80
60	25 in	25 - 60	20 - 50
30	52 in	5 - 30	5 - 30
15	100 in	0 - 10	1 - 15

Limits for impurities in Aggregate (I.S.383 - 1952)

TEST	FINEAGGREGATE	COARSEAGGREGATE
Clay, silt and fine dust in:		
Natural sand or crushed gravel sand (by weight)	4 per cent	1 per cent
Crushed stone sand (by weight)	10 per cent	
Organic impurities	The solution obtained by immersing the sample in 3 per cent solution of Sodium Hydroxide for 24 hours should be of light colour.	

- (d) **Water** shall be clean, fresh, water free from injurious amount of acids, alkalies, oils or other deleterious matter. If it is from sources other than a town protected water supply such sources shall be approved by the Engineer.
- (e) **Reinforcing Steel** shall be mild steel bars, complying with the relevant latest Indian standard Specification. They shall be clean and free from rust, scale, paint or other harmful coatings. Pitted bars or bars coated with paint, etc, shall be rejected. Wire used for tying and securing steel in position shall be galvanised annealed soft iron wire of No.16 gauge.

**3.3 Concrete Strength**

Strength of concrete required for the following nominal mix shall be as under :

- |   |  |
|---|--|
| 1. Nominal mix (1:2:4) M (-150) cubes for | minimum field strength for concrete              |
| 2. Nominal mix (1:1 1/2:3) (M-200) sq.m.  | 28 days should not be less than 150 kg per sq.m. |
- & 200 kg per sq. m respectively

The contractor has to design his own mix for the concrete work as specified in the drawing or schedule of quantities. The concrete mix shall have to be approved by the Engineer before concreting work is taken up.

Test cubes shall be taken generally from each (50 m<sup>3</sup>) of concrete poured during the progress of the work, or when a day's concrete work does not amount to 50 m<sup>3</sup> if required by the Engineer, from each day's concrete work samples shall be taken each time for testing three samples at 7 days and three samples at 28 days. The strength achieved after 7 days shall not be less than 2/3<sup>rd</sup> the 28 days strength. The cubes for the tests shall be 6" x 6" x 6" (15 cm x 15 cm x 15 cm) and will be tested as specified in IS 456 - 1964 Table V Acceptance Criteria for Concrete. The result of the tests in any of the recognised laboratories shall be taken as final and binding on the contractor.



All arrangements for testing concrete cubes shall be made by the contractor , all the materials and labour for making , curing and transporting the cubes for carrying out necessary tests including the cost of testing shall be at the cost of the contractor.

In case the compressive strength obtained from the test cubes of concrete is less than the minimum specified strength the work is liable to be rejected.

If, however , strength are higher than the specified due to good control or otherwise, the contractor will have no claim for extra payment.

#### 3.4 **Batching of Concrete Mixture :**

- (a) **Proportioning Limitations :** The contractor shall, in collaboration with the Engineer design the mixes to obtain the strengths set forth in paragraph 3.03. The design shall be based on the water cement ratio theory. The mix shall be adjusted to obtain the requisite work ability as measured by the slump test. The slump in general shall be as follows :

Mass concrete	:	50 mm
Floor slabs	:	50 mm
Road & pavements, machine finished	:	50 mm
Heavy reinforced sections	:	50 mm
Thin vertical reinforced section and columns	:	100 mm

- (b) **Cement and Aggregate Measurement:** Aggregate shall be accurately measured by measuring boxes, cement in Standard sacks need not be weighed.

- (c) **Water measurement :** Water measurement shall be by volume or by weight provided the measuring device can be maintained so that its inaccuracy will not exceed one per cent. Total water shall include all surface water carried by the aggregate.

- 3.5 **Mixing :** When concrete is machine mixed, it shall be done in a batch mixer of approved type, which will ensure a uniform distribution of the materials through the mass, so that the mixture is uniform in colour and homogenous. The mixture shall be cleaned at frequent intervals while in use . The mixing of each batch shall continue not less than 1½ minutes after all the materials and water are in the mixer during which time the mixer shall turn a speed of about 60 meter per minute. The column of the mixed materials per batch shall not exceed the manufacture's rated capacity of the mixer.

When hand mixing is authorised by the Engineer, it shall be done on a watertight platform. The materials shall be turned at least three times after the water is added and until the batch is homogeneous in appearance and colour.

Concrete shall be poured and consolidated in its final position within half an hour of mixing. The retempering of concrete which has partially hardened, i.e. remixing with or without additional cement aggregate or water, shall not be permitted.

- 3.6 **Forming :** All forms for concrete work shall be neatly constructed of finished lumber surfaced on the side in contact with the concrete except that the form for the concrete which will be exposed shall be of planed timbers.

Forms and centres shall be clean, watertight, substantial and sufficiently braced to maintain their proper position during the placing, spading or vibrating of the concrete, Joints in forms shall be horizontal or vertical and shall be close enough to prevent leakage and loss of mortar. Forms once used shall have nails with drawn and surface to be in contact with concrete thoroughly cleaned before using again. Forms shall be set to line and grade and so constructed and fastened as to produce true lines.

The inside of the forms shall be thoroughly wetted or coated with non-standing mineral oil or other approved materials. When oil is used, it shall be applied before the reinforcement is placed. Wetting of the forms shall be immediately before depositing concrete.

Temporary opening shall be provided at the base of column and wall forms and other places where necessary to facilitate cleaning and washing out of debris and inspection immediately before depositing concrete.

Forms shall be designed and constructed in such a manner as to permit removal of sides leaving the bottoms of members undisturbed.

No centres or forms shall be struck or removed until the concrete placed therein has developed sufficient strength to safely support the loads imposed thereon and at all times the consent of the Engineer shall be obtained before forms are removed. Under no conditions shall forms centers, shoring etc., be removed from the following items until the minimum time, as specified for the items has elapsed.

Concrete Items	Minimum time between placing concrete and removing forms therefrom
(a) Footings, walls, etc., having a uniform and direct bearing on the ground	24 hours
(b) Side beams, girders, columns piers and the other concentrated load areas	24 hours to 48 hours. As directed by Engineer-in-charge
(c) Slabs (props left under)	3 days
(d) Beam soffits (props left under)	7 days
(e) Removal of props to slab,	
i) Span upto 4.5 m	7 days
ii) Spanning over 4.5 m	14 days
(f) Removal of props under beams and Arches	
i) Spanning upto 6 m	14 days
ii) Spanning over 6 m	21 days

Extreme care shall be exercised in removing forms to avoid injury to the concrete.

Foundations and footings need not be formed where the nature of the soil is such, in the judgement of the Engineer, that the sides of the trenches or other excavation will properly receive the pour. It shall be the responsibility of the contractor to secure Engineer's approval of all neat excavation, including the points at which neat excavation is desired.

The form work shall be so constructed that the maximum permissible deviation of the finished concrete shall not exceed 6 mm in vertical plane and 12 mm in horizontal plane from the theoretical line.

**3.07. Placing Reinforcement :** Reinforcing bars shall be sized and located as shown on the drawings. No reinforcement shall be bent or straightened in a manner that will injure the material. Bars with kinks or sharp and shall not be used.

Bars shall be accurately set and held in place by system of bar chairs, bolsters, wire ties of not less than 16

B.W.G etc., Spacing and location shall be as shown as drawing and concrete coverage shall be not less than the three (3) inches for below grade concrete spread footings. Blocks of concrete on ground to hold the reinforcement in proper level shall be of 150 Kg/cm<sup>2</sup> strength . The clear spacing between bars shall be not less than 1<sup>1</sup>/<sub>4</sub>" time the maximum size of the coarse aggregate or not less than 25 mm.

Bars shall be lapped as per IS standards, unless otherwise shown on the drawings. Splicing of bars at selected positions shall be determined by the Engineer.

Welding may be permitted and shall be carried out as directed by the Engineer, by competent and experienced welders using approved electrodes to first class technique. Exposed reinforcement intended for welding with future extensions shall be protected from corrosion without extra charge.

- 3.8. Placing concrete :** Before placing concrete, the forms shall be thoroughly cleaned of all chips, shavings etc., concrete shall not be deposited in standing water. Concrete shall be thoroughly worked around reinforcement, embedded items, and into the corners of the forms concreting shall be carried on at such a rate that the concrete is at all times plastic and flows readily into spaces between bars, Concrete shall be vibrated with an approved type of internal vibrator. Vibrator shall not be left in any position for more than five (5) seconds and shall not be used against forms in slabs placed on grade. Construction joints shall be located and formed as directed by the Engineer and shall be such as to last impair the strength and appearance of the structure. Sufficient section shall be provided in the keys to resist shear. Construction joints in column shall be made at the underside of the floor, Haunches and column capitals shall be considered as part of the built monolithic with the floor construction. Construction joints in floors shall be located near the centres of spans of slabs, beams and girders.
- 3.9. Protection :** All concrete shall be adequately protected from mechanical or other damage of or at least seven (7) days after pouring. No backfill against retaining wall shall be permitted for at least seven days.
- 3.10. Defective concrete :** If any concrete is found defective, in strength, not true to line or level, or is poured out of position, the Engineer may direct that such concrete be removed or repaired, or that other corrective measures be taken as determines. All such repairs and replacement shall be carried out at Contractor's cost.
- 3.11. Curing of Concrete :** Concrete surfaces, exposed to the air, shall be kept free from excessive drying by the use of continual water spray bunding, wet purlap cover or an approved curing compound for a period of twenty nights continuously after the concrete is placed. If the curing compound is applied to a surface which is later to be painted, the compound shall be of the resin base type that is not detrimental to the applied point.
- 3.12. Finishing Concrete Slab & Floor Finishes :**
- (a) **Wood Float finish :** In finishing the tops of concrete slabs which are exposed to the weather, the forms shall be completely filled with concrete and the surface brought to grade with as little working as possible. Tolerance greater than 1/8" to 10 feet of surface will not be permitted. The surface shall be wood floated until it is free blemishes and gives a smooth appearance.
- (b) Floors shall have a hardened finish which shall be accomplished as follows :
- After the forms have been filled with concrete and the surface has been brought to a true plane by means of 'jitter bugging' bull floating and wood floating, the floor shall be given a medium sweat finish with hand and / or machine steel trowels and allowed to cure until perfectly dry.
- A hardener solution shall be applied strictly in accordance with manufacturer's recommendations.
- (c) **Walls and Ceilings shall be form finished other surfaces :**
- On all other surfaces, all voids and honeycombs shall be patched after forms are removed. Patching shall be done by chipping and scarifying the defective area, and filling with grout composed of one(1) part cement and two (2) parts sand (by volume). The surfaces to be patched shall be thoroughly wetted before applying the grout Patched areas shall match adjacent concrete in appearance.
- Finishing with Plaster :** All concrete surfaces which are to receive cement plaster shall be 7 mm to 10 mm deep with minimum 100 hacks per sq.m.
- 3.13. Bounding and Construction Joints :**
- Before depositing new concrete on or against concrete which has set, forms shall be retightened, old concrete surface shall be roughened, cleaned and drenched thoroughly with water reinforcing steel shall be cleaned of all dried cement mortar and loose mill scale. Concrete in each unit of construction shall be placed continuously, Construction joint locations will be as who shown on the plans or as approved and shall be kept to a minimum consistent with sound construction practice.

All construction joints shall be made watertight by the use of keyways grouted with cement mortar. A layer of cement mortar (1:2) mix or as specified should be laid over the surface of the old concrete before placing new concrete thereon. Where shown on the plans, water stops shall be provided.

Construction joints, unless otherwise detailed on the plans, shall be located midway between the supports in beams and girders. Joints in the members of a floor system, shall be at or near the centre of the span.

**3.14. Grouting of steel column bases :**

All columns base plates shall be grouted with cement mortar mix 1:2 to a thickness as specified and shall be mixed as thickly as possible consistent with fluidity. It shall be consolidated by thoroughly ramming with suitable blunt rammer, until the space has been completely filled.

**3.15. Anchors, Sleeves, Inserts etc :**

Embed into the concrete all necessary anchors, sleeves, inserts, wall ties etc., as may be required for the installation and erection of other work. All such items will be furnished to the Contractor by others with the necessary instruction and templates for their placement. Bolts shall project from the face if the concrete the distance called for on the details of sufficient distances to allow for the proper attachment intended. All threads shall be oiled/greased and protected by waterproof caps.

**3.16. Clean - up :**

Any and all work of this and/or other traders soiled or damaged in the execution of the work under this Section of the specification shall be thoroughly cleaned, repaired and/or replaced. Periodically, during the construction and immediately after completion of the work covered by this section of the specification the contractor shall remove all scrap material, debris etc. remaining from his work from the premises leaving the premises in the clean and orderly condition.

**3.17. Measurement :**

All concrete work shall be measured and paid for as per I.S. 1200 - specifications pertaining to method of Measurement of Building work.

**4. BRICK WORK**

**4.1. Scope of work :**

The contractor shall furnish all labour, materials, tools and appliances with services necessary to complete brick work masonry and floor tiling etc., in accordance with the drawings and as specified herein.

**Mortar Preparations :**

Mortar for brick work and pointing shall be as specified herein namely in proportion as per schedule. Mortar shall be prepared by mixing cement and sand in specified proportion in dry. The mortar shall be used within half an hour of mixing. No hand mixing is permitted.

**4.2. Materials :**

Bricks shall be table moulded, of uniform size, shape and colour and must be well burnt so as to give a clear ringing sound when struck. They shall be clean, whole and free from flaws, cracks, stones or lumps of any kinds, especially like. They shall have sharp edges and angles and even surface and shall be sound and hard to resist compression. They shall be from a source to be approved by the Engineer. No bricks after immersion in water for 24 hours shall absorb more than 15 per cent of its weight. 4½" and 9" bricks walls shall be built fair

- faced on one side only. All other walls or quarter thickness shall be built without exception with fair face to both sides. 4½" brick work shall be carried out in panels measuring approximately 5' - 0" x 5' - 0" with

R.C. millions of 4½ x 3" with 4 Nos. of 1/4" bars laid in (1:2:4) concrete properly filled and cured. This R.C. work shall not be measured separately but will be included in the brick work rate.

#### **4.3. Workmanship**

All bricks used shall be kept soaked in water for at least 12 hours prior to use. The work shall be set out by the Contractor. No brick bats shall be used for the work except where required to complete a standard bond.

All joints in brick work shall be uniformly laid. Each layer of brick work shall be laid plumb and level and with correct break of joints. No mortar joint shall exceed 15 mm in thickness.

The works shall be kept wet for at least 7 days after laying the last course.

Brick work shall not be raised more than 10 courses a day unless otherwise approved by the Engineer - in - Charge

Brick work shall be uniformly raised all round and no part shall be raised more than 3" - 0" above another, at any time. The Contractor shall provide all necessary openings for doors, windows or such other services and shall embed all fittings and fixtures (if separately paid for) at no extra cost.

### **5. PLASTERING AND POINTING**

#### **5.1. Cement Plaster :**

Cement and fine screened sand shall be thoroughly mixed dry in proportion specified. Water shall then be added gradually and the mortar mixed thoroughly until it is homogenous in appearance and uniform in colour and of the required consistency. No more mortar shall be prepared than can be used in half an hour. The joints of the masonry shall have been raked to a depth of 3/4". The surface to be plastered shall be thoroughly washed and drenched with water and the plaster then applied, and worked evenly to the specified thickness by means of long straight edges.

The surface finish shall be as specified. Ordinary finish may be done with wooden floats or steel the trowels as directed in which case the surface is rubbed over until it is even and smooth.

When neeru finish is specified the surface will be rendered even with long wooden straight edges without trowelling before the neeru is applied. Neeru shall then be applied, as thin as possible to avoid surface cracking, and rubbed over to an even smooth surface first by wooden straight edges and then thoroughly by steel trowels, "Neeru" shall be applied finally and rubbed down sufficiently to make the surface even and smooth and shall be specified in 5.05. The plaster shall be kept constantly wetted for about 7 days.

All corners and angles shall be perfectly plumb and true and soffits and arches shall be true to shape. All jambs and reveals shall be carefully finished at the door and window frames. All lines shall be true and straight and levels correctly maintained. Internal angles shall be rounded. If so directed and all edges shall be rounded, splayed or beaded as directed without extra charges.

The measurement shall be net, in square foot or square metre, openings being deducted. Jambs, reveals, sills and soffits at openings will be measured and paid for.

When plaster is included in the masonry work with a comprehensive rate for both. It shall cover all jamb reveal sills and soffit finishes without extra charges. The rate shall also include for making good and completing the plaster after the tiles or skittings are laid either by him or by any other contractor.

All cornices, mouldings, etc. shall be formed in the masonry and/or concrete work and finished with plaster as details and instructions. Nailed cornices will not be permitted. Ceiling mouldings projecting less than 18 mm thick may, however, be permitted to be formed in plaster only.

#### **5.2. Water-proof Cement Plaster :**

Water proof cement plaster shall be as specified herein before for cement plaster work excepting for the following:

In the preparation of cement and sand mortar, cement shall be mixed with an approved water-proofing compound such as Pudlo. Cico No.1 composed waterlock etc., all as per manufacturer's instructions and as directed by the Engineer-in Charge.

When the thickness of plaster is 12 mm the same shall be carried out in one coat only. All plaster work having thickness over 12 mm shall be carried out in 2 coats.



### 5.3. Cement Pointing Brick Work :

- (a) **Materials :** Cement mortar for pointing shall be of 1 : 3 mix prepared as per specification No. 5.01.
- (b) **Construction details**  
:
1. Unless other type of pointing are specified in the item or the special provisions pointing shall be of the grooved type. The joints in the masonry shall be raked out to a depth not less than the width of the joint or as directed in the special provisions or by the Engineer, when the mortar is green. The joints are to be brushed clean of dust and loose particles with a stiff brush. The area shall then be washed and the joints thoroughly wetted before pointing is commenced.
  2. The raked out joints shall be filled with mortar of the specified mix and required consistency and well pressed and rubbed smooth.
  3. A semicircular depression 3 mm (about 1/8") diameter shall be made in the joint by pressing a clean string with trowel keeping the string exactly horizontal and on the center line of the joint. The vertical joints shall be similarly marked. These depressed lines will then be immediately rubbed with a nayla till they become uniformly 6 mm (about 1/4") deep and 6 mm (about 1/4") wide and assume fairly blackish colour. Intersection of the horizontal and vertical joints shall be finished neatly with the vertical line just touching the horizontal line but not crossing it. Where joints are not horizontal and vertical as in the case of uncoursed rubble masonry, the pointing shall be made along the centre line of actual joints and the junctions of pointing made neatly. The pointing mortar shall not be spread over the adjoining stones. Mortar pointing shall be restricted to the width of the joints and all superfluous mortar shall be removed with a trowel.
- (c) **Watering :** The pointed face shall be kept continuously wet for 14 days after initial set.
- Should the contractor fail to water the work as specified, the Engineer, may if required in the interest of work and to keep the scheduled programme, supply labour, materials and equipment to water the work and charge the cost to the contractor.
- (d) **Item to include :** Cement pointing shall include erecting and removal of scaffolding, all labour, materials and equipment incidental to complete the pointing, dewatering, if necessary till the mortar is set unless separately provided for, raking out joints cleaning wetting, filling with mortar, trowelling, pointing with nyla and watering.
- (e) **Measurement and Payment :** The Contract rate shall be for a unit of one square meter of cement pointing. The dimensions of individual measurement shall be correct upto a centimeter and quantity calculated correct to one place of decimal of a square meter.

### 6. FLOORING

**Cement Granolithic Flooring :** Unless otherwise specified, this shall be 25 mm (1") thick. The concrete mix shall be 1:2:4. The sand shall be specially screened of all dust. The coarse aggregate shall be well graded and shall not exceed 3/8" size. The surface to be paved shall be thoroughly cleaned wetted for at least 24 hours before the paving, shall be consolidated thoroughly and compacted by heavy wooden rammers. The surface shall be trowelled smooth without using any cement powder dry or in the form of slurry. The trowelling shall be continued until moisture ceases to exceed from the mass. The paving shall be laid in panels of approved size alternately. If the surface is to be lined the rate shall include for this. If the paving is to be coloured only, approved mineral colour shall be added to the mix. The paving shall be cured for 21 days and it shall be protected during this period with hessian or other suitable material which will not stain the surface.

Measurement shall be for superficial area between the finished wall and column faces. Ironite or equivalent hardening materials shall be added as per manufacturer's specification to obtain a heavy duty floor and as stated in the Schedule of Quantities.

The entire floor shall be laid in panels required with edges grooved with regular timber or metal battens.

#### 7.1. General

The Indian Standards wherever referred to herein shall be the latest edition of such standards.



## 7.2. **Materials**

All materials used shall be new, first quality composition conforming to the IS standards. All Structural steel shall be of tested quality and shall comply with the requirements of I.S. Mild steel nuts and bolts shall be made from steel or round bar quality and not rebar. All bolt heads and nuts shall be made in accordance with relevant I. S. Specification and unless known or specified otherwise are to be hexagonal. Marker's test certificate shall be made available to the Engineer or his representative when called for.

## 7.3 **Design & Fabrication**

All Structural Steel work shall be in accordance with IS 800 and loading shall be in accordance with IS 875 where applicable.

All smithy work shall be clear and sound and the metal shall not be burnt or injured in any way.

No drifting shall be allowed and all nuts are to fit tight. Washers shall be used where necessary. Particular care must be taken to ensure free expansion and contraction wherever provided for drawing or specification.

## 7.4 **Workmanship**

The method of fabrication and assembly shall be in accordance with the best accepted practice. Unless otherwise specified or noted all work shall be installed and or erected true to lines and places with vertical lines plumb and horizontal lines level.

## 7.5 **Erection and setting up**

The erection of steel work shall be in accordance with IS 800. The Contractor shall be responsible for the suitability, safety and capability of all plant and equipment used for the erection.

The Contractor shall also provide necessary assistance which the Engineer may require for checking the setting out.

It shall be the contractor's responsibility to see that the component parts fit correctly and according to the match marks.

No gas cutting of holes or bolts shall be allowed to fit the component parts in line or level or any other manner.

All members must be so formed that they may be assembled without straining or forcing into position. The members shall be true and free from any twist kink, buckle or open joints. Failure in this respect will involve rejection of the defective member or complete structure.

Greatest accuracy is to be observed to facilitate erection at site.

Screwed ends of tie rods and other bolts or machined surface shall be efficiently protected from injury during transit.

## 7.6 **Welding**

(a) **Electrodes** : Electrodes complying with IS 814 shall be used.

(b) **Welders** : All welding operation shall satisfy the requirements with IS 1181.

(c) **Workmanship** : Welding of M.S. shall be in accordance to IS 816 special attention should be given to a suitable sequence of welding to keep the internal stresses within admissible limits.

## 7.07. **Inspection**

The Engineer and /or/his representative shall have free access at all reasonable times to all places where the work is being carried out and shall be provided by the contractor at contractor's expense with all necessary facilities and labour for inspection during fabrication and erection. The Engineer or his representative shall be at liberty to reject in whole or in part any work or material that does not conform to the terms of the specifications and may order the same to be removed, replaced or altered at the expense of the contractor.

## 7.8 Painting

### (a) Prime coat of painting on steel work.

The whole of steel work except, where encased in concrete and excepting edges and adjacent surface areas to be field, welded, before being despatched from contractor's work shall be dry and after being completely cleaned from rust, mill scales, dust etc. to the satisfaction of the Engineer or his representative and shall be given one coat of shop paint as specified in the schedule of quantities. Paint shall be applied by well designed brush and not by cloth nor rags. Surfaces which are to be held in contact by bolting shall be painted before assembly and parts brought together while still wet. Unless otherwise demanded by the Engineer, all surfaces in-accessible after intermittent or continuous welding shall be given two coats of red lead paint conforming to IS 102 before assembly. The first coat shall be dry and hard before the Second coat is applied. Galvanised iron or machined steel work is not to be painted.

Field painting shall be limited to touching up after erection.

After assembly and erection all surfaces requiring 'touch up' shall receive a coat of brush applied primer as specified in the Schedule of quantities.

### (b) Final Coats : After erection is completed the entire structural steel work shall be painted with two coats of oil paints of approved quality shade and make and as per the colour schemes, specified on the drawing or as directed by the Engineer.

The job shall be carried out in workman like manner, all corners shall be painted carefully. The painting operation shall conform to IS 1447. Before painting all loose scales and dust shall be removed. The colour coat shall be laid evenly, properly with brushes of approved quality and make. Each coat of colour shall be allowed to dry thoroughly before the next is laid on. No hair marks from the brush be left of the work.

## 7.9 Measurement :

All structural steel fabrication and erection shall be measured and paid or in accordance with IS 1200. Specifications on methods of measurement for building works with the following points considered that.

- (a) No allowance shall be made for rolling margins for rolled sections.
- (b) No extras of any nature shall be paid for welding weights or site belt connections and bolts and nuts. The contractor's rate should include for the above.
- (c) No deductions will be made for belt holes in the members.

## 8. White Washing, colour Washing, Distemper

8.01 Providing and applying white wash as specified on drawing include all materials, labour, plant, tools, scaffolding, etc., required to complete the job in all respects.

### 8.2 MATERIALS:

**Lime:** Best approved quality of lime conforming and shall be slaked in conformation to IS 1635-1960.

**Colour:** Colour shall be of shade and quality as approved by the Engineer.

**Distemper:** This shall conform to IS 427 and 428 and shall be of shade and quality approved by the Engineer.

**Cement base colour :** Approved shade of snowcem or Durocem paints shall be used.

### 8.3 WORKMANSHIP:

The whole work shall be done in workmanlike manner as per the relevant specifications of Kerala/Madras/ Maharashtra/ P.W.D. Handbooks. The manufacturer's specifications and directions shall be strictly followed wherever advised in preparation, of the materials mixing with water, manner of application etc. A prime coat shall be applied before applying the first coat of the colour or distemper wash.

## 9. A.C. Sheeting

### 9.01 SCOPE OF WORK:

The contractor shall furnish all labour, materials tools and services necessary to complete all A.C. sheeting work either in Roof sheeting, louvers, side cladding in accordance with the drawing and as specified therein.

### 9.2 MATERIALS:

**Asbestos sheets :** The asbestos sheet shall be corrugated asbestos cement sheets of 'Trafford Type' or 'Big Six' of 'Everest Brand' or equivalent standard product of approved product of approved make and conforming to IS 459, and of shapes and sizes required to complete the work. All fixing accessories shall conform to IS 730.

### 9.3 WORKMANSHIP:

Asbestos sheets shall be installed by experienced workmen as shown on the drawings and in a workman like manner.

The completed surface shall be waterproof and rigidly attached to the structural frame of the building.

Final coat of paint on steel members shall have dried for at least 24 hours before the erection is started. All holes shall be accurately drilled as specified by the manufacturer and laps shall be made over the structural members and sheeting shall be bolted on not greater spacings than those specified by the manufacturer or as directed by the Engineer.

## 10. Woodwork, Carpentry & Joinery

10.01 Timber to be sound, bright and well conditioned, clean, free from waves, injurious open shakes, large, loose or dead knots, and cut square and straight, all to be thoroughly seasoned and with only a very small proportion of bright sap and no discoloured sap whatever. The whole of the timber to be cut into the required scantlings at least three months before being framed. Timber shall generally conform to the Indian Standard Specifications.

Scantlings of all types of timber shall be straight. Warped scantlings shall not be used. Before use on the works, the scantlings shall be kept in a covered and well ventilated place and shall be placed in alternative longitudinal and transverse layers with air spaces of not less than 1" between them.

The workmanship shall be of the best quality. All 'wrought' timber is to be sawn, planed, drilled or otherwise machined or worked to the correct sizes and shapes indicated in the drawings or as specified. The finished scantlings shall be of uniform width and thickness throughout. Where the 'nominal' dimensions are stated for 'wrought' timber, an allowance of not more than 1/16" shall be permitted for each 'wrought' surface.

All carpenters' work shall be accurately set out and framed together and securely fixed in the best possible manner and with properly made joints. All joints, must fit accurately without wedging or filling. All nails, screws, plugs, pins etc., shall be provided as necessary and as directed and approved. After the woodwork has been erected, if any undue shrinkage or bad workmanship is discovered, the contractor shall forthwith amend the same without any extra charge.

The joiner shall perform all necessary mortising, tenoning, grooving, matching, tonguing, housing, rebating and all other works necessary for correct jointing. He shall also provide all metal plates, screws, nails and other fixings that may be ordered by the Engineer-in charge, or that may be necessary for the proper execution of the joinery works specified. Joiner shall also carry out all works necessary for the proper construction of all framings, linings, etc., and for their support and fixing in the buildings.

Joinery shall be constructed exactly as shown on the drawings or as instructed by the Engineer-in-Charge. Where joints are not specifically indicated they shall be the recognised forms of joints for each position.

Loose joints are to be used where provision must be made for shrinkage or other movements acting other than in the direction of the stresses of fixing or leading.

Glued joints are to be used where provision need not to be made for shrinkage or other movements in the connections and where sealed joints are required. All glued joints shall be cross tonged or otherwise reinforced. All nails, springs etc., are to be punched and puttied.

All surfaces to be glued are to be kept clean, free from dirt, dust, sawdust, oil and other contamination. Adequate pressure should be applied to glued joints to ensure intimate contact and maintained whilst the glue is setting.

All skirting, architraves, plates and other joinery works shall be accurately scribed to fit the contour of any irregular surface against which they may be required to form a close but connection.

The joiner shall take all necessary measures to check or prevent capillary penetration of water in the joints and open connections of external joinery works, and in all other positions where joinery works may be exposed to water.

The joiner shall ensure that all weathering surfaces, threading, grooves and joints etc., and all open connections in external joinery works shall be properly executed and shall obtain a reasonable degree of weather-resistance.

The frames, shutters, beadings etc., for doors and windows shall be country teak as described in the items of the 'Schedule of Probable Quantities' and shall be provided with M.S. holdfasts out of

12" x 1½" x 1/8" thick flats fixed in to the jambs of walls. The number of holdfasts shall be as indicated in the drawings. Wherever necessary rawl plugs bolts etc. shall have to be used for fixing framing etc. iron screws shall be used unless otherwise indicated.

All exposed wood work in country teak shall be painted with three coats of oil paint of approved make and shade.

All woodwork coming in contact with or embedded in masonry work shall be treated with two coats of solignum or coal tar as directed by the Engineer -in-Charge prior to installation

#### **10.02 FIXTURES AND FASTENINGS**

The scale of all fixtures and fastenings shall be as per relevant items in the bill of quantities and drawings. They shall be of Iron mongery and of good workmanship.

All fixtures and fastenings shall be new, sound and strong. They shall be of best quality. The size, shape, design and finish shall be as shown on drawings and approved by the Engineer. Samples of all fixtures and fastenings shall be got approved by the Engineer and shall be deposited in the Engineer's office for reference.

All fixtures shall be fixed to the joinery in a secure and efficient manner. Any of the fixtures damaged during fixing shall be removed and new ones fixed in their place and the surface of joinery made good where affected at the contractor's expense. The metal sockets shall be provided to all bolts where the shoots enter brick, stone, concrete etc. These shall be securely fixed flush with the surface in to mortises and cemented

.Mortise plates over the holes shall be used in situation where the shoots enter wood. Parliamentary hinges

shall be used when so shown in the drawings. But and similar hinges shall be counter sunk on the leaf edge and wood frame to a depth equal to the thickness of flaps of the hinge.

#### **10.03 GLASS WORK**

All glass to be of best manufacture and as per live weight specified, free from bubbles smoke, waves, air holes, scratches or other defects, to be delivered on the site in maker's original packages and the maker's guarantee to be produced if called for by the Engineer-in-charge.

All glass to be cut accurately to fit easily into the rebates and to be well puttied, back puttied, and sprung as directed by the Engineer -in Charge. Care to be taken to see that the putty does not show beyond the sight lines of panes.

Glazier's putty to be made of pure whiting and raw linseed oil, and to be used fresh except to metal windows and doors where approved metal beading is to be used.

All glass broken or cracked during the progress of work to be reinstated all glass to be cleaned both sides and all glazing left clear and perfect, as directed by the Engineer -in -charge, at the completion of the contract.

#### **10.4 The rate of woodwork to include the cost of the following:**

- :> Cost of providing and fixing of various fittings and fixtures.
- :> Cost of painting, applying wood preservatives, etc.
- :> Screws, nails, hold fasts, etc.
- :> Fixing and erecting in position all woodwork.

Woodwork in general shall be measured as per IS 1200 - 1964 unless otherwise mentioned in the items of the 'Schedule of probable Quantities'.

#### **10.5 Rolling Shutters:** The rolling shutters, where specified shall be of the size to suit the openings and shall be positioned as shown on the drawing and / or as directed by the Engineer.

The rolling shutter shall be fabricated from 18 BG steel and machine rolled with 75 mm rolling centres with effective bridge depth of 12mm lathe sections, interlocked with each other and ends locked with malleable cast iron clips.

The Guide shall either rolled or pressed deep channel sections 75 mm deep and 25 mm wide fitted with necessary fittings and fixtures.

The hood cover shall be made of 20 gauge G.P. Sheets with necessary stiffeners and frame work to prevent sag. The button lock plate shall be made of 3 mm thick M.S plate and 95 mm wide reinforced with angle/T Iron of suitable section with 6 mm dia. M.S. rivets interlocked with stride of curtain.

The locking arrangement shall consist of hasp and staple on the bottom plate, lockable from both sides.

Unless, otherwise specified for overall area of rolling shutters upto 8 sq.m pull and push type hand operated shutters shall be used, for area between 8 and 10 sq.m. push and pull type shutters shall be provided with ball bearings. For area larger than 10 sq.m mechanical gear type or electrically operated shutters shall be supplied. Operation of shutter shall be by means of worm and work, wheel and shaft arrangement and it shall be possible to operate the doors both from inside and from outside. The shutter shall be capable of withstanding horizontal forces upto 20 lbs /sq.ft without any appreciable deflection.

#### **10.6 BATTEN AND LEDGED DOORS**

**Timber :** The timber used shall be country teak wood conforming to specification 10.01. Planks for battens shall not be more than 8" nor less than 4" in width but all the battens shall be of same width. The thickness of battens and ledges shall be as per relevant items of the bill of quantities. Fixtures and fittings shall be provided as per specification 10.01 and number as per drawings.

#### **10.7 GLAZED WINDOWS & VENTILATORS**

**Timber:** The timber used shall be country teak wood conforming to specification 10.01.

**Iron Bars:** Iron bars 5/8 " dia. shall be used for windows and ventilators at 4" centre to centre horizontally embedded into the timber frame work or as specified in the schedule.

**Fixtures and Fastenings:** Fixtures and fastenings shall be as per specification No. 10.02 and hold fasts shall be as per specification No. 10.01 and number of hold fasts as per drawings.

**Glazing:** Glazing work in windows shall be as per specification 10.03. The glass shall be of sheet 4 mm thick for windows and 1/4" thick figured glass for ventilators louveres or as specified in the schedule.

## **11. Water Proofing & Miscellaneous Items**

**11.01 DAMP-PROOF COURSE:** Damp-proof course shall be provided at position shown in the drawings or indicated by the Engineer. In masonry walls of buildings it shall normally be placed above the external ground level. It shall be specified by the Engineer.

The brick or stone masonry shall be levelled, flushed up and prepared as directed to receive the damp proof course.

Unless other wise specified the damp-proof course shall consist of a layer of cement mortar of specific proportions and thickness with top surface covered with two generous coats of tar or bitumen of approved make and the surface then sprinkled with fine sand

Alternatively, a layer of cement concrete 1:2:4 (Cement sand and coarse aggregate) mix and specified thickness shall be provided in place of cement mortar as above.

All exposed surface of the damp -proof course shall be finished fair and smooth. The external edge shall be chamfered if specified, and shall be finished flush with masonry surface.



## 12. Miscellaneous Structural Works

### 12.1 SCOPE OF WORK

The contractor shall furnish all labour, materials, tools, equipments and service necessary to fabricate, deliver to job site and erect or install all 'Miscellaneous iron and structural steel' as indicated in the drawings or as specified herein.

Materials and work shall include, but it is not necessarily limited to the following

- (a) Anchor bolts, standard bolts, nuts, washers, rivets, inserts, anchors, structural steel beams, columns and steel tools if used
- (b) Sleeves, Lintels and steel plates and all other miscellaneous steel items to be embedded in concrete work.

### 12.2 MATERIALS

All materials used shall be new, first quality composition conforming to the following specifications:

- (a) Steel, Bolts and Nuts: All structural steel shall be of tested quality and shall comply with the requirements of IS 226. Mild steel nuts and bolts shall be made from steel of round bar quality and not from rivet bars. All rivet bars shall comply with IS 1148 Rivet bars for structural purposes. All bolts and nuts shall be made in accordance with relevant IS or BS specification and unless shown or specified otherwise are to be x-O-x (hexagonal nuts and heads) maker's Test certificate shall be made available to the Engineer or the Engineer's representative when called for.
- (b) Steel Tubes: Steel tubes if used in the construction shall be of tested quality and shall comply with the requirements of IS-116 or to the latest edition of BSS1775, including all amendments and addendums thereof.
- (c) Pipe sleeves: Pipes shall be min. heavy quality C Class or Sch. 80 Galvanized Iron.

### 12.3 DESIGN AND FABRICATION

All structural steel work shall be in accordance with IS 800 'Code of practice for use of structural steel in General Building Construction' and leading shall be in accordance with IS 875' Code of practice for structural safety of Building Leading Standard' where applicable.

All smithy work shall be clean and sound and the metal shall not be burnt or injured in any way.

No drifting shall be allowed except for bringing together several parts forming a member but the drifts must not be driven with such force so as to disturb or damage the metal about the holes. All nuts are to fit tight, washers shall be used where necessary.

Particular care must be taken to ensure free expansion and contraction wherever provided for in drawing and specifications.

### 12.4 ITEMS EMBEDDED IN CONCRETE OR MASONRY

Structural steel items, such as shear channels, plates and similar installations shall be fabricated and installed as shown on the drawings to field measurement where required.

### 12.5 STEEL PLATES

Steel plate items shall be fabricated of the materials, sizes and thickness and installed at locations as indicated on the drawings and shall be furnished complete with anchors and fastenings.

### 12.6 MARKING AND DESPATCHING

The work shall be despatched in such portions as may be found convenient for erection or as ordered by the Engineer and shall be unloaded and stacked only in the allotted space.

## 12.7 PAINTING

- (a) **Primer coat of painting on steel work:** The whole of steel work except where encased in concrete and excepting edges and adjacent surface areas to be field welded, before being despatched from Contractor's shop shall be dry and after being thoroughly cleaned free from rust, small scale dust etc., to the satisfaction of the Engineer and shall be given one prime coat of red lead paint conforming to IS102 or any other paint as specified in the schedule of quantities. Paint shall be applied by brush and not by cloth or rags. Surfaces which are to be held in contact by riveting or bolting shall be painted before assembly and the parts brought together while still wet. Unless specified otherwise, all surfaces in accessible after riveting or intermittent welding shall be given two coats of red lead paint conforming to IS 102 before assembly or any other paint as specified in the schedule quantities. The first coat shall be dry and hard before the second coat is applied. Galvanised Iron or steel work shall not be painted.
- (b) **Field Painting :** Field painting shall be limited to touching up after erection. After assembly and erection all surface requiring 'Touch up' shall receive a coat of brush supplied red lead primer or any other paint as specified in the Schedule of Quantities.

## 12.8 ERECTION AND SETTING UP

The erection of steel work shall be in accordance with IS 800. The contractor shall be responsible for the suitability, safety and capability of all plant and equipment used for erection.

The contractor shall, as contingency of the contract provide all necessary assistance which the Engineer may require for checking the setting out. The contractor shall take care to see component parts fit correctly and according to the distinguishing match marks.

All members must be so formed that they may be accurately assembled without being unduly packed, strained or forced into position, and when built shall be true and free from any twist, knick, buckle or open joints between components pieces. Failure in this respect involves the rejection of the defective member.

Greatest accuracy is to be observed to facilitate erection at site and all corresponding parts must be made interchangeable. Riveting is to be done by the hydraulic or pneumatic machines. No hand riveting shall be done. All loose, faulty or defective revets coated with a mixture of white lead and tallow. Screwed ends of tie rods and anchor bolts or machined surfaces shall be efficiently protected from injury during transit.

## 12.9 WELDING

- (a) **Qualification for Welders:** All welding operations shall be carried out by skilled welders who shall satisfy the requirements of IS1181. 'Qualifying test for metal Arc Welders engaged in welding structure other than Pipes'.
- (b) **Electrodes:** Electrodes complying with IS 914 covered electrodes for metal Arc Welding of Mild Steel or British Standard 639 'Covered Electrodes for metal Arc Welding' shall be used.
- (c) **Workmanship:** Welding of mild steel shall be in accordance with IS 816 'Code of Practice for use of metal Welding under General Construction in mild steel' welder shall work under constant competent supervision in a properly organised manner with quality welding sets and with suitable electrodes all to the approval of Engineer and to his satisfaction. Special attention should be given to a suitable sequence of welding to keep the internal stresses within admissible limits.

## 12.10 INSPECTION

The Engineer and his authorised representatives shall have free access at all reasonable times to all plates where the work is being carried out, and shall be provided by the contractor at the contractor's expense with all the necessary facilities and labour for inspection during fabrication and erection. The Engineer and his authorised representative shall be at liberty to reject the whole or part of any work or material that does

not conform to the terms of these specifications and may order the same to be removed, replaced or altered at the expense of the contractor.

#### 12.11 PAINTING OF STRUCTURAL STEEL WORK

All Items shall include painting also with 1 coat of red lead primer and 2 coats of aluminium or other approved paint.

#### 12.12 MEASUREMENTS

All miscellaneous Iron and Structural steel fabrication and erection shall be measured and paid or in accordance with IS 1200 IS 'Specifications' on method of Measurement for building works.

##### **General**

All Paints to be best manufactured and to be delivered on the site in the makers original packages and tins and the worker maker's guarantee to be produced if called by the Engineer-in-Charge. The paint shall be of the qualities suitable for use in the local climatic conditions. Thinners must be those recommended by the manufactures and used only as directed by them.

Sample tints of all finishing coats to be prepared and submitted to the Engineer-in -Charge for his approval. The priming , under coating and finishing coats shall be of different tints. The finishing coat shall be semi -gloss or matt finished as directed by the Engineer- in-Charge.

All the materials shall be kept properly protected when not in use. Lids of containers shall be kept closed and the surface of paint in open or partially open containers shall be covered with a thin layer of turpentine to prevent the formation of skin. Materials which in the opinion of the Engineer-in-Charge have become stale or flat shall not be used on the works and shall be removed from the site of the work.

The paint shall generally conform to the chemical composition and other characteristics to the relevant IS specifications.

The paint shall be put on with approved brushes, kept well bound and well worked during its application. For Iron work ,fairly stiff brushes shall be used. The painting to be carried out in such order as directed, by the Engineer-in-Charge. The brushes shall be thoroughly cleaned out before being used for a different type or class of material.

The contents of the drum or tin shall be stirred well before use. Thinning of paint shall not be permitted without the specific permission of the Engineer -in - Charge.

Each coat of paint shall be thoroughly dried before the next coat is laid on. All surfaces shall be adequately prepared before the application of each coat. The surfaces shall be rubbed down with an abrasive material appropriate to the surface under treatment.

All painting work shall be in strict conformity to the sample panels approved by the Engineer-in-charge.

All floors to be twice washed ,all works on paint to be sponged of the work generally to be touched up after all other workmen have left, the whole of the buildings left clean, perfect and water -tight on completion to the satisfaction of the Engineer-in-charge.

The rate to include the cost of following:

- :> Supplying and mixing the paint as specified.
- :> Preparing the surfaces to be painted
- :> Providing and erecting scaffolding if necessary and removing the same after the work is completed.
- :> Lifting of materials to any height.
- :> Curing and protecting the painted surfaces.

### 13.1 OIL PAINTING

**Wood Work:** Preparation of surfaces -Paint shall not be applied to a wood work which is not well seasoned. The surface to be painted must be thoroughly dry, clean and smooth. Wood work must be passed by the Engineer -in-charge before any paint is applied. The surface shall be rubbed smooth with sand paper, first with coarse grade about 2½ and then finished with medium grade paper say 1½. Sand papering must be finished with the grain. When finished, no scratches from the coarse paper should show.

Before priming coat is applied, the knotting shall be done by one of the following methods as directed by the Engineer-in-charge.

- a) Ordinary or size knotting . This shall be applied in two coats. The first to be made dry grinding red lead in water and mixing it with strong glue size, used hot. The second coat shall be of the red lead bound in linseed oil and thinned with boiled linseed oil and turpentine.
- B) Lime knotting. Cover the knot with hot lime and leave on for 24 hours: then scrape off and coat the surface with size knotting as above.
- c) Patent knotting . This consist of 2 coats of varnish made by dissolving shellac in methylated spirit of wine.

13.2 **PRIMING COAT :** After preparing the surface of wood work as above priming coat shall be applied.

Primary coat shall be as follows:

- a) On inside wood work. It shall consist of ½ lb, of red lead +8 lbs. of white lead + 1.4 liters of boiled linseed oil +0.57 litres of raw linseed +1½ oz.of litharge or patent driers and shall be applied before the woodwork is fixed in position.
- b) On outside wood work. It shall consist of 10 lbs .of white lead +2.20 litres of raw linseed oil+10 oz. of red lead + 2 oz. of litharge or patent driers and shall be applied before the wood work is fixed in position.

### 13.3 STOPPING

After priming ,all small holes ,cracks ,open joints and similar minor defects of every kind shall be stopped with putty made from pure whiting mixed to the proper consistency with raw linseed oil, a little white lead being worked in after mixing to help the hardening of the putty. On no account putty is to be used before the priming coat is put on.

### 13.4 ADDITIONAL COATS

After applying priming coats , the work shall be lightly rubbed down smooth with sand paper and the subsequent coats of paint of the specified shade approved by the Engineer-in-Charge, shall be applied. The paint shall be applied with brushes. It shall be spread as possible with brush by means of the crossing (at right angles to the grain) and then laving off with the brush in the direction of the grain over the crossing. The final coats shall be very carefully crossed and laid off so that the brush marks are not visible. Each coat of paint shall be allowed to dry thoroughly and shall be lightly rubbed down before the next is laid. Every coat shall be passed by the Engineer-in-Charge before the next is laid on it .The finished surface shall not show any hair marks, ridges, or dry patches of paints and no puddies shall be left in the corners of panels and angle of moulding.

For wood work exposed to the weather unless the number of coats of paint is mentioned in the item, three coats of paint shall be applied over and above the priming coat. In the interior wood work, two coats shall be applied over and above the priming coat.

The Painted surface shall have a semigloss or matt finish as directed by the Engineer-in-Charge.

### 13.5 EMBEDDED TIMBER

Timber embedded in masonry shall be given two coats of hot coal tar or solignum before erection. This is incidental to the item and shall not be paid separately.

#### **Masonry work:**

Stones shall be set level, plumb, with uniform joints set in full bed on mortar, with joints filled.

All stones to be well wetted, except in frosty weather, before setting and large stones to be set with a derrick. Rake out mortar joints when setting.

Utmost care shall be taken during construction that the surface of the stone is not spoiled by concrete or mortar dropping on the stones and drying. The surface of the stone shall be immediately cleaned with water if any concrete or mortar does fall on the stone faces.

Stones for masonry shall be best black Deccan trap obtainable from approved quarries. The masonry, wherever required, shall be composed generally of large stones clean flat bedded, properly selected for their places and carefully laid, with a suitable proportion of small stones and chips to fill up the interstices. The whole work shall be hand set and solidly bedded in and surrounded with mortar on every side except the face. There shall be no hollows or dry portions in work nor pinnings in the face. The face stone shall be flat bedded, shall tail back and be bound well into the body of the wall and shall not be of a height greater than either the breadth of face or length of the tail. Through-stones, covering the whole width or thickness of the walls or two feet long where the walls are thicker than two feet shall be inserted at every three feet measured horizontally and vertically. The rates for rubble masonry shall include the extra cost of the through-stones. The face of the wall shall be strictly straight. The masonry shall be shaded from the sun and kept well moistened for at least three days after completion.

#### **Cement pointing :**

Cement, sand and water required for the above work shall conform to the specifications laid down under plaster work.

Cement and sand shall be mixed in 1:2 proportion, sand being measured in measuring boxes. The mortar may be hand mixed or machine mixed.

In hand-mixed mortar, cement and sand shall be thoroughly mixed dry on a clear impervious platform by turning over at least 3 times or more till a homogenous mixture of uniform colour is obtained. Fresh and clear water shall then be added gradually through a hose and thoroughly mixed to form stiff plastic mass of uniform colour so that each particle of sand shall be completely covered with a film of wet cement. The water cement ratio shall be as directed by the Engineer-in-Charge.

Mixing platform shall be so arranged that no deleterious extraneous material shall get mixed with mortar nor the mixing water of the mortar shall flow out.

The mortar so prepared shall be used within 30 minutes of adding water. Only such quantity of mortar shall be prepared as be used within 30 minutes. The mortar remaining unused after that period or mortar which is partially hardened or is otherwise damaged shall not be retempered or remixed. It shall be destroyed or thrown away.

Before pointing, the joints shall be well raked out and washed clean with water. The pointing shall be sunk ½" from the face of the stones. Utmost care shall be taken while carrying out the pointing work, that the surface of the stones is not spoiled by cement dropping on the stone and drying. The surface of the stones shall be immediately cleaned with water if any cement does fall on the stone faces.

The pointed face shall be kept continuously wet for 14 days after initial

set. The rate for stone work shall include the cost of the following:

:> Selecting proper stones, breaking off boulders etc., in case the wall is to be constructed from stones available at site.



- 
- :> Scaffolding if necessary
  - :> Raking out joints
  - :> Sunk cement pointing

#### **APPENDIX TO GENERAL SPECIFICATION**

1. Water proofing treatment as described in Schedule 'B' shall consist of:
  1. Hot applied by bitumen at the rate of 1.2 kg / M<sup>2</sup> Min.
  2. Hessain - base self - finished felt, type 3, grade I.
  3. Hot applied by bitumen at the rate of 1.2 Kg / M<sup>2</sup> Min
  4. Hessain based self - finished felt to type 3 grade I
  5. Hot applied bitumen at the rate of 1.2 Kg / M<sup>2</sup> Min. and
  6. Pea - sized gravel or grit at the rate of 0.006 M<sup>2</sup> / M<sup>2</sup>
2. Special attention should be paid to proper overlapping of joints felts and in treatment around drainage in the roof and in treatment of the parapet walls, junctions between the roof and the vertical faces of parapet walls, chimneys etc, shall be caused by running triangular fillets of 7.5 cm size in lime or cement concrete. At the drain mouth, the fillets shall be suitably cut back and rounded off for easy application and free flow of water. The provision of fillets shall be deemed to be covered by this item of water proofing and shall not be measured or paid for separately. The water proofing treatment will have to be carried over the top of the parapet wall over the slab to its full thickness and shall not be measured and paid for separately. The graded surfaces of the roof and concrete fillets and the face of the walls shall be thoroughly cleaned with wire brushes and all cracks in the roof shall be cut out to 'V' Section cleared and filled up flush with cement mortar 1:4 or an air blown bitumen such as mexphalt Rs 85/25, stanuace industrial asphalt H6 or equivalent and such cleaning of the surface or treating the cracks shall not be paid for separately. Stone grit shall not be spread over vertical and sloping faces of plastering and at drain mouths. At these places, the surface shall be painted with two coats of bitumen solution.
3. Sequence of operation for all types of Roofs shall be
  - a) Preparatory work
  - b) Collecting and storing of materials and tools;
  - c) Cleaning roof surface of foreign matter:
  - d) Treatment of gutters and drain mouths;
  - e) Treatment of the main roof flat or sloping;
  - f) Treatment of finishing and projecting pipes;
  - g) Top dressing, that is gravel or grit , fixing or laying of tile of concrete protection ; and
  - h) Cleaning and removal of surplus materials;
4. Prior to laying , the preparatory works as described in IS: 3067 -1966/IS : 1346:1966 shall be completed and the cement or lime work allowed to set and dry. The surface of roof and that part of parapet and gutters, drain mouths, etc. over which the water proofing treatment is to be applied , shall be cleaned of all foreign matter, namely fungus, moss dust, etc, by wire brushing and dusting .

The felt is normally laid in lengths at right angles to the direction of the run off gradient, commencing at the lowest level and working upto the crest. In this way, the over laps of the adjacent layers of felt offers the minimum obstruction to the flow-off of water. The bitumen bending material shall be prepared by heating to the correct working temperature and conveyed to the point of work in a bucket or pouring can.

The felt shall be first cut to required lengths, brushed clean of dusting materials and laid out flat on the roof. This serves to eliminate curls and subsequent stretching. Each length of felt prepared for laying as described above shall be laid in position rolled up for a distance of half of its length. The hot bonding materials shall be poured on to the roof across the full width of the rolled felt as the latter is steadily rolled out and pressed down. The excess bonding material is squeezed out at the ends is removed as the laying proceeds. When the first half of the strip of felt has been bonded to the roof, the other half shall be rolled up and then unrolled on to the hot bonding material in the same way. Minimum overlaps of 100 and 75 mm shall be followed at the end and the sides of strips of felt. All overlaps shall be firmly bonded with hot bitumen.

The laying of the second layer of felt shall be so arranged that the joints are staggered with those of the layer beneath it.

Felt shall be laid as flashings in widths wherever junctions of vertical and horizontal structures occur with minimum overlap of 100 mm. The lower edge of flashing shall overlap the felt laid on flat portion of the roof and the appear edge of the flashings shall be tucked into the groove made in the parapet on the vertical face of the wall. Each layer shall be so arranged that the joints are staggered with those of the layer beneath it.

After all the layers specified have been laid and the flashings properly boned, the groove shall be filled up with cement mortar or cement concrete which, when set will satisfactorily secure the treatment to the wall. The groove fill in shall be cured by watering for at least 4 days after filling to ensure satisfactory strength and to avoid shrinkage cracks.

Drain mouths shall be widened and other items of work completed. Felt shall be generally laid as on the other portion of the proof expecting that the treatment shall be carried inside the drain pipes overlapping at least 100 mm.

The treatment to be laid in the gutters shall provide for one layer of roofing felt more than is provided on the roof proper. Hence at least two layers of felt shall be laid in the gutters. A priming coat shall first be applied. Over this, the first layer of felt shall be bonded with hot bitumen followed by successive layers of felt securely bonded together and finally painted with a coat of hot bitumen at not less than 1.5 Kg./M<sup>2</sup>.

The felt layers laid separately in the gutters shall be overlapped with the corresponding layers on the roof proper.

The felt treatment in the gutters shall be carried down in to the outlet pipes to a minimum depth of 100 mm. Where there are walls, grooves shall be cut out at a reasonable height and the felt tucked in the grooves which shall then be filled in with cement mortar.

**THE TRAVANCORE - COCHIN CHEMICALS LIMITED**  
**UDYOGAMANDAL P.O**

1. Name & Address of the Contractor :

2. Particulars of registration and class }  
in which registered } :

3. Reference regarding the }  
Contractor's made to (at least 2 }  
references should  
past work and performance may be :  
be given)

4. Previous experience on similar works :

Name of work executed & Location

Value of work

5. Any other information the Contractor may desire to give :

- Note: 1. The contractor may attach separate sheets if the space allotted here is not sufficient  
2. Certified true copies of testimonials issued in favour of the contractor authenticating the work done by the contractor should be attached with the tender. THESE COPIES WILL IN NO CASE BE RETURNED TO THE CONTRACTOR.  
3. Non-compliance of the above particulars may lead to rejection of the offer at the discretions of

SIGNATURE OF THE CONTRACTOR

# THE TRAVANCORE-COCHIN CHEMICALS LIMITED

UDYOGAMANDAL P. O.

## SCHEDULE 'A'

Schedule showing the materials to be supplied from TCC. Stores for works contracted and rates at which they are to be charged for :

Sl. No.	Materials	Rate at which the materials will be charged to Contractors	Place of Delivery
1.	Cement excluding the cost of empty Stores cement bag	Free of Cost Unless otherwise specified	From at Factory
2.	M.S. bars of various sizes :		
	Plain	-do-	-do-
	Torsteel	-do-	-do-

### Note

:

1. The charges for conveyance of materials from the place of delivery to the work site shall not be measurable and payable. The materials shall be available on all working days during office hours.
2. Other materials required for works not included in the above may be issued to contractor if required and available with TCC. The rate chargeable will be stock issued rate or the market rate at the time of issue. Whichever is higher plus 40% to cover overhead charges plus Sales tax if applicable vide cl: 14.3 of C.C. on page 10.
3. All empty cement bags shall be returned to Stores at Contractor's own cost in sound condition. It would be the responsibility of the contractor to bring to the notice of the concerned stores department the unserviceable condition of the cement bag (if any) at the time of receipt of cement and get it specifically noted on the Challan. A recovery @ Rs.4.00 per empty bag returned in damaged condition would be effected from contractor's bill. For empty bags not returned to the stores will be made at a penal rates as may be decided by the Chief Engineer.
4. M. S. bars of 12 mm dia and below may be supplied by TCC in rolls or coils as available and no extra claim for straightening the bars etc., shall be entertained. The steel will be issued to the contractor, on actual weighment. However, while paying for the item of reinforcement of weight of steel used on the work will be calculated on the basis of running length and standard weight per unit length. Claims on account of difference in actual weights and weights calculated on the basis of length will not be entertained.
5. All materials issued shall have to be accounted for by the contractor with reference to work done and surplus, if any returned to stores, at Contractor's own cost, immediately on completion of the work.
6. Cement shall be issued in jute bags and the content of each bag will be deemed as 50 Kg. irrespective of the actual weight and charged. However at the time of actual use specifically for all concrete items, if so specified, cement shall be weighed and used as per the mix design.

Sd/-

SIGNATURE OF THE CONTRACTOR

CHIEF ENGINEER (CIVIL)

# **THE TRAVANCORE-COCHIN CHEMICALS LIMITED**

**UDYOGAMANDAL P. O.**

## **ANNEXURE 'A'**

You shall carry out the entire work according to sound engineering practice. The entire responsibility for the proper execution of the erection work according to the existing laws and bye-laws at the time of contract execution will be with you. You shall conform in all respects to the requirements of local and other statutory authorities, give all notice and when required by them and pay all fees in respect of the work.

However, you shall have to follow the instructions of our or our authorised representative in respect of the following :

- a) Progress reports to be submitted to us from time to time.
- b) Progress and completion of the work according to time schedule.
- c) Execution of Contract work to our entire satisfaction.
- d) Submitting the details regarding the name of the responsible person for execution of this contract.

### **SUB-CONTRACT**

The contract is awarded to you with the clear understanding that you shall not subcontract any part or whole of this contract without our written permission and that the entire work will be carried out by your own staff and workers under your direct supervision and control.

### **TECHNICAL PERSONNEL, STAFF AND WORKERS**

You shall make available the necessary qualified and experienced supervisory staff and experienced fitters and welders, semi skilled and unskilled personnel for the complete control and execution of the order. Before setting up your site organisation, you shall submit to us detailed site organisation and erection schedule chart for our site. Only after the above is approved by us they shall be sent to our site.

We reserve the right to reject the name of any of the personnel proposed by you in this list for our own reasons.

Your competent and authorised supervisor approved by us in writing shall be available at the site at all working hours and he will be responsible to carry out the work as per instructions.

### **ENTRY PERMITS/TOKENS**

On approval of the above list of your site personnel, we shall arrange with our Security Department for the issue of Entry permits for each individual valid for a certain period to enter our premises during your normal working hours at site, you shall instruct all your staff and workers that only on production of these permits they will be allowed to enter our premises. On expiry of the validity dated the old permits should be returned to us to be replaced by fresh ones.

In case of loss of such permit by any individual the details should be immediately reported to us. A fresh permit will be issued against each case on merits.

We will provide at one convenient point free of cost the utilities such as (1) Steam (2) Water (3) Electricity for carrying out the site work.

After completion of your work at our site you shall arrange to remove all temporary structures like site office, site stores, temporary lifting arrangements etc., within a reasonable time and give us the entire area in absolute clean condition.



## **SECURITY**

You shall make your own arrangements at your cost for the safe custody and security of your machinery, tools and other materials brought to our site and kept in your site stores or elsewhere by employing then necessary watch and ward personnel, duly approved by us. We shall not be responsible for any loss damage to your properties. However, in case of any theft the same shall be notified in writing to our Security Department for information and without any obligation what so ever from our side.

## **SAFETY PRECAUTIONS**

All the safety measures to avoid accidents should be strictly in accordance with the safety rules and regulations laid down by the Government Authorities and also the rules framed by the Company from time to time.

You shall take all safety precautions and shall provide at your own cost proper scaffolding, life belts, shock proof helmets etc., to avoid accidents and to ensure safe of not only the personnel working under you but also the safety of the staff and workers of other contractors working at the same site.

You shall also take necessary precautions on the walls, roof and / or any part of our buildings / structures so that they are not damaged or disfigured during the course of you working and shall be made good by you or by us at your own cost.

## **ACCIDENTS**

We will not be responsible for any damages or compensation payable in consequence of any accident or injury to any of your personnel.

You shall insure at your own cost against any such eventuality as per factory rules and submit to us documentary evidence of the insurance Policy taken, positively, prior to commencement of your work at our site.

In case any accidents at or near the site in connection with the execution of your work, you shall immediately make a detailed report of the accident and submit the same to us in writing. You shall also report such accidents to the competent authority as laid down by the existing rules and regulations and inform us the same.

## **INSURANCE**

You shall be completely responsible to arrange for a suitable insurance policy at your own cost to cover workmen and supervisory staff of your company or any of your sub-contractors under the Workmen's Compensation Act of 1923 & 1933 and under the Employer's Liability Acts and shall identify us against any claims demands, proceedings costs., charges and expenses whatsoever in respect thereof or in relations thereto. All the necessary insurance in accordance with the above and as per the prevailing labour law i.e. workmen's Compensation, Fatal Accidents Act, etc., have to be covered by you at your own cost.

Documentary evidence of the Insurance Policy or Policies should be submitted to us for our scrutiny and approved positively prior to commencement of work at our site.

You may also, in your own interest, arrange for a suitable insurance against the loss, damages, theft, loss due to fire of all your machinery equipments, tools, tackles and all other materials brought by you to the site for the execution of this contract.

## **WORKING AREA & CLEANLINESS**

You will keep the site of work in a clean and sanitary condition. After the completion of your work you shall arrange to remove all the temporary structures, surplus materials, dirt, debris etc., belonging to you or sub-contractors from the site and finished work shall be handed over to us in a clean and complete state.

### **HANDING OVER THE INSTALLATION & COMPETITION CERTIFICATES**

After completion of installation and testing the system, the installation will be taken over by us. The final inspection will be carried out jointly by your site in-charge and by your Engineer-in-Charge, after verifying that all necessary approvals have been obtained and that all the documents like drawings, technical specifications etc., are in order.

Immediately after the inspection, installation will be taken over and we shall issue the necessary completion certificates, certifying the completion of the contract to our satisfaction and informing you that the installation has been taken over by us. The relevant guarantee period will, therefore, be counted from the date of issuing such completion certificates.

### **APPROVAL OF INSTALLATION BY GOVT. AUTHORITIES**

Wherever approval of Government authorities required as per existing rules and regulations you shall arrange at your own cost for the same. All incidental charges, necessary inspection fees., etc. shall be borne by you.

### **MODIFICATIONS & RECTIFICATIONS OF IMPROPER & DEFECTIVE WORKMANSHIP**

We shall during the progress of work have the power to order verbally or in writing from \*time the dismantling, removal and proper re-execution of any work in respect of workmanship if the same in our option is not in accordance with our specification, standard engineering practice, or the existing rules and regulations as given in the contract and you shall carry out such orders at your own cost.

(\*time to)

Further, in case any of the Government authorities like Factory Inspector, Electrical Inspector, Fire Insurance Association etc., demand that certain modifications are to be carried out to meet the prevailing rules and regulations shall carry cost to us.

### **SUSPENSION OF WORK**

You shall on our written instructions delay or suspend the progress of the whole work or any part thereof such time or times and in such a manner as we may consider necessary and shall during such delay or suspension project and secure the work so far as necessary in our opinion.

The extra cost if any incurred by you in giving effect to our instructions under this clause will be paid by us unless such delays or suspension is otherwise provided for in the contract or is necessary by reason of the nature of the work, a weather condition or be some default on your part or is necessary for the safety of the entire work cost unless you give us notice in writing of your claim within 7 days of our written instruction, regarding the suspension to work.

Any delay of this nature will, of course, be given due consideration while considering the date of completion of work by you.

Under no circumstances you shall suspend the work pending our decision on any question under the contract.

Sd/-  
**CHIEF ENGINEER (CIVIL)**

## Special Conditions

(To be read in conjunction with relevant conditions/specifications)

1. Mechanical Mixer and vibrator for compaction should be compulsorily used by the contractor/s, for all CC or RCC work.
2. It is incumbent on the contractor/s to collect and stack materials in the areas assigned in orderly and clean fashion and to shift any/all of them to suitable areas for any purposes required by TCC at the expense of the contractor/s.
3. It is incumbent on the contractor/s to keep the work site and building or structure under construction cleaned daily and kept in orderly fashion and co-operate with TCC's authorities in this direction when specially demanded without extra charges for such works, failing which such works will be carried out by TCC and the charges will be recovered from the contractor.
4. Contractor/s is/are obliged to carry out all items of work strictly in the priority and sequence and schedule fixed by the Engineer incharge.
5. TCC will not be under any obligation to make good any loss/damage the contractor/s may suffer on account of delay in the completion of work or nonperformance within the time/period of contract because of strike or loss or damage of the contractor's equipment or tools and plant or riot due to civil commotion or demonstration for reasons beyond their control.
6. Quantities given in the schedule are only approximate. Selected contractors should be prepared to carry out any quantity of work in excess, in respect of the projects named, at the same agreed rate. Attention of contractor/s invited to clause (12) and (17) of the conditions of contract and that substantial deviation or variation in specification alone will entail review/enhancement of quoted/agreed rates and extension of time of completion of the contract alone when given for any reason, will not automatically entitle the contractor/s to review/revision of rates.
7. It is incumbent on the selected contractor/s to extend all reasonable co-operation to TCC to complete the works in time, even though there may arise delays in the procurement or supply of a component or material in time and to compensate for this by completing other possible items earlier. It is also incumbent on the contractor/s to extend all reasonable assistance to other special agencies employed by TCC for the project and other departments TCC for fulfillment of their works.
8. For items involving expertise, it is incumbent upon the selected contractor/s to engage only the best specialist workers on the job recommended by the Engineer-in-charge concerned and if the work is found not satisfactory in the opinion of the Engineer-in-charge, it will be in order for TCC to delete such item/s from the scope of this contract and arrange to have such works carried out by other agencies and any consequent loss to TCC will be made good from the contractor/s. However, the contractor/s will not have any claim to the saving or profit accruing to TCC as postulated in clause (9) of the conditions of contract.
9. Not with standing anything stated elsewhere in the contract schedule or conditions, TCC will be free to confer part or whole of the contract to one or more contractor/s agencies, as exigencies demand or is deemed fit. Omission will not entitle the contractors to any compensation in any form or manner, whatsoever.
10. Contractor/s is/are enjoined to observe strictly safety regulations of the factory and other rules in force and keep their work force in strict obedience to them. Contravention or neglect will entail penalties and termination of the contract and any monetary loss to TCC should be made good by contractor/s.

11. Unless otherwise stated elsewhere in the tender notice or other related documents, all tenders shall be valid for a period of 30 days from the date of receipt of tender, extendable by mutual agreement if so required. If the contractor withdraws his tender / quotation within the period of validity of 30 days or the period extended by mutual agreement , TCC will be free to enforce claim for compensation of any loss to TCC, consequent to re-tender or other arrangement. The earnest money deposit of contractor in that event, will be forfeited by TCC. On acceptance by TCC, rates should be firm for the entire duration of contract for the project contemplated under this notice / contract.
12. It is incumbent on the contractor to have himself / his firm registered and licence for contract taken from the administering authority as required under contract Labour ( Regulation & Abolition ) Act, 1970 and Kerala Contract Labour Rules 1974 (effective from 22-3-74) or their subsequent amendments. He should maintain registers, file returns etc. as required under the provisions of the said Acts.
13. It is also the responsibility of the contractor to observe the provisions of any other law like the ESI Act, EPF Act, Payment of Wages Act, Minimum Wages act, the contract (Abolition & Regulation) Act, etc. to the extent they are applicable to him in the respect of the workmen engaged or employed by him in or for execution of the work as per this contract. The contractor shall indemnify employer against any claim that may be made on the Employer for any obligation under the said acts, or any allied Act in respect of the contractor's workmen and any amount which may be required to be paid by Employer under said Acts shall be recovered from the contractor by deduction from the amounts due to him or by other means.
14. In the case of percentage contracts, the overall percentage rate quoted by contractor and accepted and specified above or below the estimate rates, shall not be varied on any account whatever and that it shall hold good for all items done under the contract irrespective of variations in quantities and/or substitution by extra items.
15. Preparation and payment of bills : In part and final bills, amount of individual items and sum total of all items measured and recorded are calculated at the quoted rates given in the Schedule value of departmental materials used on the items billed for should be deducted. Percentage discount or premium is applied on the net amount . Other deductions like W.C. Premium Income Tax etc. are also effected as applicable and subject to the conditions agreed.
16. Persons engaged for work in the factory by the Contractors will be permitted to enter the factory for work only after registering them under ESI Scheme by the personnel Department.
17. The names and ESI Registration Nos. of workers should be furnished in the prescribed form to the security Office and pass should be obtained for their entry into the factory.
18. Attendance particulars and Wage Statement in respect of workers should be submitted on fortnightly or immediately after the work is over, whichever is earlier to the Accounts Department for recovery of both Employers and Employees' contribution from the Contractors' Bills and remittance of the same to the ESI Corporation in time.
19. In case the contributions are not remitted to the ESI Corporation on the stipulated date due to delayed submission of Attendance particulars and wages statements by the Contractor the ESI Corporation will impose penalty and the same will be recovered from the Contractors' Bills.
20. In case there is impersonation or the Attendance particulars and wage statements furnished by the Contractors are not true or the Contractors violate any statutory provisions in regard to contract labour or any rules and regulations framed by the Company from time to time in the matter, the Contractors will be held responsible for all the consequence arising therefrom, apart from black listing them from taking contract in the Company.
21. The fortnightly attendance particulars and wage statements of a Calender month in the prescribed form in respect of contract workers should be submitted on 20th and 5th of every month to the Deputy Finance Manager (B) through the Department concerned, in order to pay their contribution to the ESI

corporation for each wage period within 21 days of the last day of the respective wage period as stipulated under Regulation 31 of the ESI (General) Regulation 1950.

22. In case the Company fails to pay contribution to the ESI Corporation on behalf of the Contractor on the stipulated date (20th of every month ) due to delayed submission of attendance particulars and wage statements by the Contractors, "interest" at 6% payable under Regulation 31-A of the ESI (General) Regulations 1950 and "damages" At 19% payable under Section 85-B of the ESI Act, 1948 as amended, will be recovered from the Contractor's bills.
23. Quoted rates, approved rates, reduced rates, extra item rates, all other types of payments agreed or awarded shall be inclusive of all sales tax or other levies which may be payable or become payable to Central Government, State Government, local authorities or other statutory bodies. No claim whatsoever for considering Sales Taxes and other levies if any shall be entertained.
24. Electrical equipments brought for the job should be as per the standards stipulated by the Electrical Inspectorate of Kerala and only after inspection and certification by the Electrical Superintendent (Statutes & Modernisation) these equipments can be used.



## Conditions of Contract

1. The person whose tender is accepted who is hereinafter called the 'Contractor', shall, before the date fixed for commencement of the work, execute an agreement if so required as per terms of acceptance of the contract in the form prescribed by The Travancore Cochin Chemicals Limited, who are hereinafter referred to as "TCC", and shall pay for all stamps and legal expenses incidental thereto.
2. The Contractor shall execute all work in the most substantial and workman like manner and materials used shall be of the best quality specified and approved Work shall conform minutely to drawings and specifications which form the basis of the accepted tender and to other written instructions, sketches, or drawings if any, relating to the work which may be issued from time to time by TCC or TCC's authorised deputy appointed in this behalf. The contractor shall employ only skilled men who have been engaged in the respective trades and similar works.
3. The contractor shall supply at his own cost all labour, materials and tools required for the proper execution of the work . He shall also provide at his own cost all necessary safety measures required to protect workmen and the public from accident and adjacent structures from damage and shall be bound to bear all expenses of defence of any action or legal proceeding that may be brought up by any person for injury sustained or damages caused owing to neglect of safety precautions and pay damages and costs awarded in consequence.
4. The contractor shall execute the work generally as per short specifications furnished elsewhere of the contract and standards current in the Engineering trade and shall not assign or sublet this contract to any other person without the written approval of TCC.
5. The work under execution shall be open to the inspection and supervision of TCC's authorised deputy in this behalf at all times. The contractor shall have a responsible qualified agent present at the work during usual working hours and at all other times when reasonable notice by TCC or its deputy to visit the work shall have been given, when the contractor himself is not present to receive their orders and instructions. The contractor shall see that such an agent is competent and qualified for such work and notify to TCC the appointment and name of the agent in writing and such an appointment shall not be valid unless approved by TCC in writing. Orders and instructions given to the contractor's agent shall be considered to have the same force and validity as if they have been given to the contractor himself. The usual working hours will be from 8 a.m. to 5 p.m. unless otherwise agreed to and approved by TCC.
6. If the contractor makes a deviation from the specification, plan or instructions without the previous approval of TCC, such deviation and work will be deemed to have been gratuitously done and the contractor shall dismantle or demolish the same at his own cost and expenses and re-do the work to conform to the specifications and instructions given by TCC or TCC's deputy appointed in this behalf.
7. TCC shall have the power to make any alterations in the original designs, drawings or instructions that may appear to be necessary and sound during progress of work and the contractor shall be bound to carry them out on the same conditions as the contractor agreed to do similar work and if there shall be no agreed rate for such work, it shall be done at rates as stated in clause (12) below.
8. The date fixed by TCC for commencement and completion of the work shall be strictly adhered to and observed by the contractor as elaborated in clause (17) below.
9. If the contractor becomes insolvent or otherwise is unable to carry out the work or if without the written consent of TCC, assigns or sublets his contract in contravention of clause (4) above or if in the opinion of TCC the contractor delays or neglects in any manner, to finish the work within the time prescribed and not show any proportionate progress, TCC may forthwith terminate this contract and employ any other agency

to continue and complete the work. The contractor will be liable to make good to TCC damages or loss suffered by TCC on this account. The contractor shall have no claim however to compensation for any loss that may accrue to him from collecting any materials or engagements he may have entered into account of this work and shall have no claim whatsoever to any saving or profit that may accrue to TCC on any account of this work.

10. In the event of termination of this contract as stated in clause (9) , the contractor shall not in any manner hinder or prevent TCC or any agency or workmen engaged by TCC from proceeding to complete the work and it shall be lawful for TCC to take possession of all tools, plant, materials and stores or any portion there of on the place where the works are to be performed and pay for the same in account at the contract rates or if not specially provided therein at current market rates or ask the contractor to remove them from the premises. If the contractor fails to remove the same TCC may remove them at the contractor's expenses or dispose of them in auction on contractor's account.
11. In the event of termination of the contract as mentioned above in clause (9), the contractor shall not be entitled to recover or be paid any sum for any work thereto for actually performed under this contract unless and until TCC shall have certified the performance of such work and the value thereof. The contractor shall duly be entitled to payment of the amount so certified after deducting value of loss or damages accrued to TCC vide clauses 9, 10, 13, 15 and 16 of this schedule and other recoveries stated elsewhere in other schedules, as per this contract.
12. Rates tendered by the contractor shall include the cost of all materials, hire for tools and plant, scaffolding, staging and materials, S.T. therefore, all incidental labour such as marking, setting out, preparing templates and materials therefore, as per directions of TCC or TCC's authorised deputy and premia for worker's insurance as per clause (16) below. No claim for increase of rates accepted will be given except when TCC are satisfied that substantial deviation from specification in respect of the work or item of work has been agreed to by them prior to execution in writing. For items of work for which there is no accepted rate as per this contract, rates worked out on current local rates of P.W.D. or other suitable data reckoned at basis rates quoted by contractor and agreed to by TCC , will be paid. Regarding modus of measurement or description not specified in the contract schedule or specified in the contract schedule or specification, TCC will be guided only by relevant Indian Standards.
13. On satisfactory completion of the work, the contractor shall be paid according to the tender rates accepted by TCC subject to conditions for new item of work as elaborated in clause (12) above, after deducting amounts if any paid to the contractor during progress of work. Interim payments will be paid at the following stages of work provided steady and proportionate progress is kept up by the contractor to merit such payment in the opinion of TCC.  
  
Payment of items for which there is no tendered rate will be deferred till the final bill is prepared. Interim bills as aforesaid will be paid up to the extent of 75% of the actual work done till the date of bill at the accepted rates and not as payments on accepted rates and ..... of the amount will be retained by TCC till the final bill. All such interim payments shall be treated as payments on account only to be recovered in the final bill for the complete work and not as payments for actual work done and completed.
14. As security for the due and proper performance of the contract the contractor shall deposit with the TCC the specified sum of rupees as per tender notice free of interest. The amount shall not exceed 7½% of the probable amount of contract. The deposit or and part thereof may be applied by TCC for realising any dues for which the contractor become liable under terms of this contract and the balance if any shall be returned to the contractor at the termination of the contract
15. TCC shall supply to the contractor at TCC stores the materials mentioned in the Schedule. The cost of such materials will be recovered by setting off against the amounts due to the contractor at the specified rates, under bills submitted by him or otherwise TCC may issue any other materials required by the contractor at their option at the request of the contractor, in the interest of the progress of work, the value of which is included in the contractor's quoted rates and TCC will recover the value of such materials issued

to and received by the contractor at the book value of such materials, and for this purpose, such materials will be deemed to have been included in the relevant Schedule for recovery. Value of articles supplied in excess of actual needs as per measurements will be recovered at 200% of the price in the Schedule or book value of TCC Stores accounts, unless returned by the contractor to TCC Stores and certified as such by TCC's deputy detailed in this behalf. The contractor shall not have any right to the dismantled materials or other surplus materials for which TCC has partly or fully paid. TCC will supply the proprietary products such as are detailed in schedule. Loss or misuse of such materials will entail steps mentioned in clause (11) at 200% of their actual book value of TCC Stores accounts.

16. In undeveloped areas where there are no power supply and water lines within 30 metres the contractor/s should make his/their arrangements to provide these at his/their cost and TCC are under no obligation to provide these for purpose of construction, unless TCC deems it necessary and expressly undertake to provide these in their interest.
17. The contractor shall complete all works stated, described, enumerated in the contract documents before as tender notice. On no account will the time of completion be extended by TCC. If the contractor fails to complete the work in all respects before the said date, penalty at the rate of Rs. as per tender notice per week-day will be recovered in addition to the terms contained in the conditions of this contract. The contractor shall have to start work within 10 days of the acceptance of his tender. TCC may extend the period under extraordinary circumstances which in their opinion, warrant such extension. Any such extension of time alone shall not warrant any review or revision of rates for agreed items for any reason.
18. On all questions relating to interpretation of drawings, sketches of specifications and to the quality of workmanship and materials used the TCC's decision shall be final and conclusive and not subject to arbitration and will be binding on the contractor. No dispute on such matters will be entertained by TCC.
19. All the conditions set forth above and the Schedules attached here to and the other relevant documents relating to this contract are binding on contractor unless repudiated by the contractor expressly in writing before confirmation of this contract.

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