FOR SPECIAL ATTENTION OF THE TENDERERS

Proof of Registration in P.W.D. & Technical Education as a contractor shall be attached with the tender.

2. Current income tax clearance certificate shall be enclosed along with the tender.

3. Bank Guarantee will not be accepted towards Earnest Money Deposit, Additional Security, withheld amount etc.

4. The following particulars shall also be furnished by the contractor along with the tender.

a. List of details of works executed by the contractors with their values :

b. A list of details of works under execution by the contractor, with their values.

c. Annual turn-over of the contractor for the last one year. Necessary certificate to the effect issued by the respective Bank shall be attached.

5. The lowest tenderer when informed that his tender is under consideration shall have to furnish Pert Chart in the proper form Within a Week from the date of receipt of letter calling for Pert Chart. The Pert Chart shall conform to the departmental time schedule for the completion of the work furnished in the Tender Notice. If the Pert Chart is not received within a week from the date of receipt of communication, his tender will not be considered.

6. The tender documents will be issued to the contractors wherever registered their names as contractors in P.W.D. or Technical Education in the appropriate class only.

Tender Schedule containing ..... pages ..... plans

issued to .....

.....

Contractor

Executive Engineer, P.W.D.
Technical Education Division-II
Trichy - 620 020.

SPECIAL INSTRUCTIONS TO THE TENDERERS

The tenderers should carefully go through the tender schedule and quote their rates for all items and alternative items also.

The rates should be filled in neatly in figures and words and taking into account the metric units specified in the tender. Scribblings, over-writtings and erasings should be avoided as far as possible.

3. The amount of each item of work should be worked out. Proper care must be taken in working out the amount of each item of work taking into account the unit for which the rate is quoted and the quantity of work to be doneunder the item.

4 The total from each page should be arrived at end carried out to every page and the grand total value of work should be worked out and shown at the end.

The tenders should be submitted along with a covering letter giving full details as called for in the tender notice and with particular care to the following items if they are registered contractors, if registered together with the copy of letter registering them in the appropriate class (classes)

Details of the earnest money deposit remitted such as the Chalan No. and date and Treasury / Reserve Bank of India in which the Earnest Money Deposit was paid.

In case the tenderers are eligible for concessional Earnest Money Deposit and accordingly they have remitted, the reference number and date in which the concession was granted to them is to be specified and if possible, a copy of this aforesaid reference may be enclosed along with the tender for ready reference.

Income tax clearance certificate should be submitted along with the tender or the tender on which the income tax clearance certificate was submitted to this office should be specified.

Details of previous work done by the tenderers covering the cost of the work, the agreement number and date, the department in which the work was carried out etc. so as to assess the previous experience of the tenderers at once as also make an easy reference to their record of work, Year-wise details should be furnished as to see that these tenderers have minimum experience of major buildings.

List of various machineries and other equipments at the tenderers disposal for use in the execution of the work.

The tender forms should be filled in while submitting the tender. The tenders submitted without filling-up the tender form are liable to be rejected.

The tenders must be submitted in a foolscap cover hereby duly signing all the conditions, plans and Schedule issued as Tender documents.

Director

Executive Engineer, P.W.D.
Technical Education Division II
Trichy - 620 020.

TENDER NOTICE

On behalf of the Governor of Tamil Nadu, tenders will be received by the Executive Engineer, Technical Education Division-I, at his office at Trichy-620 020, upto 3.00 p.m. on ..... for the work of

The tenders should be in the prescribed form obtainable from the Executive Engineer's Office.

The tenders will be opened by the Executive Engineer, Technical Education Division-II at 3.15 p.m. at the place and on the date aforementioned.

The tenderers or their agent are expected to be present at the time of opening of tenders. The tender receiving officer will, on opening each tender, prepare a statement of the attested and unattested corrections therein and hand it over to the tenderer concerned and initial all corrections in the presence of the tenderers. If any of the tenderers or their agents finds it inconvenient to be present at the time, then in such a case, the tender receiving officer will, on opening the tender of the absentee tenderer, make out a statement of the unattested corrections and communicate it to him. The absentee tenderer, shall then accept the statement of the corrections without any question whatsoever.

2. Tenders must be submitted in sealed covers and should be addressed to the Executive Engineer, Technical Education Division-I, Trichy-620 020. the name of the tenderer and the name of the work being noted on the cover.

If the tender is made by an individual, it shall be signed with his full name and his address shall be given. If it is made by a firm, it shall be signed with the co-partnership name by a member of the firm, who shall also sign his own name, and the name and address of each member of the firm shall be given. If the tender is made by a Corporation, it shall be signed by a duly authorised officer who shall produce with his tender, satisfactory evidence of his authorisation. Such tendering Corporation may be required before the contract is executed to furnish evidence of its Corporate existence

3. Each tenderer must also send a certificate of Income Tax verification from the appropriate income-tax authority, in the form prescribed therefore. The certificate will be valid for one year from the date of issue for all tenders submitted during the period.

In the case of proprietary or partnership firm it will be necessary to produce the certificate aforementioned for the proprietor or proprietors and for each for the partners as the case may be.

If the tenderer is a registered Public Works Department contractor and if a Certificate for the current year had already been produced by him during the calender year in which the tender is made it will be sufficient if particulars regarding the previous occasion on which the said certificate was produced are given.

All tenders received without a certificate aforementioned will be summarily rejected

Contractor

Executive Engineer, P.W.D.
Technical Education Division-II
Trichy - 620 020.

4

4 Each tenderer must pay, as earnest money, a sum of Rs ..... (Rupees ..... only) into the branch of State Bank of India or into the Government Treasury or Sub-Treasury within the jurisdiction of the Executive Engineer, concerned to the credit of revenue deposits on behalf of the Executive Engineer of the Technical Education Divisiion-II Trichy-620 020. and enclose with his tender the Chalan endorsed accordingly. The Earnest Money Deposit can also be paid in any other form as may be approved by the State Government from time to time as per para 155 of T.N.P.W.D. Code. This earnest money will be refunded to the unsuccessful tenderer on application, after intimation is sent of rejection of the tender or at the expiration of ~~two~~ three months from the date of tender, whichever is earlier. The refund will be authorised by the Executive Engineer by suitable endorsement on the Chalan. The earnest money will not be received in cash or currency notes by the Public Works Department Officer, save in exceptional cases, where there are no Treasuries or Banks within the jurisdiction of the officer calling for tenders. When currency notes are given, the tenderer should sign his name in full with date, on the back of all the currency notes given by him, whatever their denominations may be.

The earnest money will be retained in the case of successful tenderer and will not carry any interest. It will be dealt with as provided in the tender.

5. The fender will remain valid for a period of three calender months from the last date for receipt of tender. The validity period can be extended further, if the contractor give his consent in writing, specifying the period of extension.

i. The tenderer whose tender is under consideration shall attend the Executive Engineer's Office, before the end of the period specified by written intimation to him. If the tenderer fails to attend the office before the end of the specified period, his tender will not be considered. He shall forthwith, upon and intimation being given to him of acceptance of his tender by the officer duly authorised in this behalf under article 299(1) of the consitituion, hereinafter called the accepting authority "make security" deposit of 2 percent of the value of contract in one of the forms prescribed in Tamil Nadu Public Works Account Code (i.e.) by taking into account of the amount of earnest money deposit, already deposited with the tender, it would be sufficient to pay the balance amunt to make up the 2 percent of the value of contract for the purpose of security deposit.

ii. The security deposit together with earnest money deposit and the amount withheld according to clause 64-1 of General conditions to the contract, shall be retained as security for due fulfilment of contract. If a cash security deposit is made by the contractor, he shall follow the procedure laid down in the preceding paragraph for payment of earnest money deposit and such deposit shall not bear any interest.

iii. On receipt of written communication of acceptance of tender if the tenderer fails to pay the requisite security deposit within the period specified in the written communication or backs out from the tender or withdraw his tender, the earnest money deposit shall be forfeitedf to the Government.

iv. If the contreactor fails to carry out the contract, after paying the requisite deposits, then he will be laible for the excess expenditure, if any incurred to complete the work as contemplated in the General conditions to the contract.

Contractor

Executive Engineer, P.W.D.
Technical Education Division-II
Trichy - 620 020.

It shall be expressly understood by the tenderer, that on receipt of written communication of acceptance of tender from the accepting authority, there emerges a valid contract between the Governor of Tamil Nadu and the tenderer, for execution of the work without any separate written agreement. Hence, for this purpose, the tender documents, i.e. tender notice, tender offered by the contractor, General conditions to the contract, special conditions to the contract, negotiation correspondence, written communication of acceptance of tender etc. shall constitute a valid contract and that will be the foundation of the rights of both the parties to the contract. Provided that, it shall be open to the accepting authority to insist execution of any written agreement by the tenderer, if administratively considered necessary or expedient.

The tenderer shall examine clearly the Tamil Nadu Building Practice and also the general conditions to contract contained therein, and sign the Divisional Office Copy of the Tamil Nadu Building Practice and its agenda volume in token of such study before submitting his tender unit rates, which shall be for finished work in-situ. He shall also carefully study the drawings and additional specifications and all the documents connected with the contract. The Tamil Nadu Building Practice and other connected documents with the contract, such as specifications, plans, descriptive specification sheet regarding materials etc. can be seen at any time between 10.00 a.m. and 5.45 p.m. on office days in the office of the Executive Engineer, Technical Education Division-I, Trichy-620 020. A copy of the set of contract documents can also be had on payment of Rs..... for each set.

The tenderers attention is directed to the requirements for materials under the clause 'Materials and Workmanship' in the general conditions to the contract. Materials conforming to the ISI standards shall be used on the work and the tenderer shall quote his rates accordingly.

Every tenderer is expected before quoting his rates to inspect the site of the proposed work. He should also inspect the quarries, and satisfy himself about the quality and availability of materials. The names of quarries and kilns etc. wherefrom certain materials are to be obtained will be given in the Descriptive specifications sheet. The best class of materials to be obtained from the quarries or other source, defined shall be used on the work. In every case the materials must comply with the relevant standard specifications Samples of materials as called for in the standard specification or in this tender notice or as required by the Executive Engineer in any case shall be submitted for the Executive Engineer's approval, before the supply to site of work is begun. If the contractor after examination of the source of materials defined in the Descriptive Specification sheet is of the opinion that materials complying with the standard or other specifications of the contract cannot be obtained in quality or sufficient quantity, from the source defined in the Descriptive Specification Sheet, he shall so state in his tender and state where from he intends, to obtain materials, subject to the approval of the Executive Engineer.

The Government will not, however, after acceptance of contract, rate, pay any extra charges for lead or for any other reason, in case the contractor is found later on to have mis-judged the materials available. Attention of the contractor is directed to the "General conditions to contract" regarding payment of seigniorage tolls, etc.

Contractor

Executive Engineer, P.W.D.
Technical Education Division-I,
Trichy - 620 020.

9. The tenderer's particular attention is drawn to the sections and clauses in the General conditions to the contract dealing with :

i. Test, inspection and rejection of defective materials and work.

ii. Carriage.

iii. Construction Plant.

iv. Water and Lighting.

v. Cleaning up during progress and for delivery.

vi. Accidents.

vii. Delays

viii. Particulars of payment.

The contractor should closely peruse all the specfications clauses which govern the rates which he is tendering.

10. A schedule of quantities accompanies this tender notice. It shall be definitely understood, that the Government does not accept any responsibility for the correctness or completeness of this schedule and that this schedule is liable to alternations by omissions, deductions or additions at the discretion of the Executive Engineer, Technical Education Division-I, Trichy-620 020. or as set forth in the conditions of contract. The tenderer will, however, base his lumpsum tender on this schedule of quantities. He should quote specific rates for each item in the schedule, and the rates should be in Rupees and in sums of five paise. The rates should be written both in words and figures and the units in words. The tenderer should also show the totals of each item and the grand total of the whole contract and quote in the tender a lumpsum for which he will undertake to do the whole work, subject to the conditions of contract such lumpsum agreeing with the total amount of schedule-A. This schedule accompanying the lumpsum tender shall be written legibly and free from erasures, overwritings or conversion of figures. Corrections where unavoidable should be made by crossing out, initialling, dating and rewriting.

11. Tenderers offering a percentage deduction from or increase on the estimate amount and those not submitted in proper form or in due time will be rejected. Rates or lumpsum amounts for items not called for, shall not be included in the tender. No alteration which is made by the tenderer in the contract form the conditions of contract, the drawings, specification, or quantites accompanying same will be recognised and if any such alterations are made the tender will be avoid.

12. The tenderer should workout his own rates, without reference being made to the Public Works Department current schedule rates or the Public Works Department estimate which are not open for inspection by the tenderers.

13. The price at which and the source from which certain particular materials shall be obtained by the contractor are given at the end of the schedule accompanying the tender form. Tenderers must accept the materials at these prices, and shall quote their prise for finished work accordingly. Notwithstanding any subsequent change in the market value for these materials, the charge to the contractor will remain as originally entered in the written contract. No centage or incidental charges will be borne by Government in connection with this supply.

Contractor

Executive Engineer, P.W.D.
Technical Education Division-I,
Trichy - 620 020.

14. The attention of the tenderers is directed to the contract requirements as to the time of beginning work, the rate of progress and the dates for the completion of the whole work and its several parts. The following rate of progress and proportionate value of work done from time to time, as will be indicated by the Executive Engineer's certificates of the value of work done, will be required. Date of commencement of this programme will be the date on which the site (or premises) is handed over to the contractors.

Period after date of commencement (1)	*Percentage of work completed based on contract lumpsum amount* (2)

Note :

The periods to be entered in column (1) for the purpose of defining the rate of progress may be fixed by the Executive Engineer to suit each case.

15. No part of the contract shall be sub-let without written permission of the EE/ Superintending Engineer nor shall transfer be made by power of attorney, authorising others to receive payment on the contractor's behalf.

16. If further necessary information is required the Executive Engineer of the divisions will furnish such, but it must be clearly understood that tenders must be received in order, and according to instruction.

17. The Exe. Engr. or other sanctioning authority reserves the right to reject any tender or all the tenders without assigning any reason therefore.

18. The tenderers who are themselves not professionally qualified shall undertake to employ qualified technical men at their cost to look after the work. The tenderers should state in clear terms, whether they are professionally qualified or whether they undertake to employ technical men required by the department specified in the schedule below for the work. In case the selected tenderer is professionally qualified or has undertaken to employ technical men under him he should see that one of the technically qualified men is always at the site of the work during working hours personally checking all items of works and paying extra attention to such works as may demand special attention (e.g.) reinforced concrete work etc.

(In the format below enter or incorporate the latest norms fixed by Government for the employment of Technical Asst. from time to time and penalty for non-employment of such technical assistant etc.

Value of Contract	*Qualification and No. of Technical Asst. to be employed*

Contractor

Executive Engineer, P.W.D.
Technical Education Division-I,
Trichy - 620 020.

Note :

1. Item (1), (2), (3), (4), (5) and (6) should be scored No.1 out in case where not applicable to the particular work.

2. A penalty of Rs.500/- per month, for diploma holder and Rs.1000/- per month for degree holder, be levied in case of default on the part of contractors in following the norms laid down above.

3. The employment of technical assistants could be based only on the value of contract. Engineers with Mechanical Engineering qualification and retired from Civil Engineering Department are also suitable to supervise the Civil Engineering works because of their experience in Civil Engineering field.

4. In case the contractor who is professionally qualified is not in a position to remain always at the site of work and to pay extra attention to such work, as may demand special attention (e.g. R.C. work, etc.) he should employ technically qualified man as prescribed above.

19. Tenderers who have not already registered themselves as P.W.D. contractors shall furnish evidence of good record and capacity to do works.

20. A tenderer submitting a quotation which the tender accepting authority considers excessing and / or indicative of the insufficient knowledge of current prices or definite attempt at profiteering will render himself liable to be debarred permanently from tendering or for such period as the tender accepting authority may decide. The tender rates should be based on the controlled price for materials, price permissible for the tenderer to charge a private purchaser under the provision of clause 8 of Hoarding and Profiteering Prevention Ordinance 1943 as amended from time to time and on similar principles in regard to labour and supervision in the construction.

21. The contractor should offer employment to ex-today tappers as far as possible. The number of ex-today tappers to whom he can and he should undertake in tne agreement to offer such employment to such number.

Note :

This paragraph should be scored out, if the cost of the work involved is less than Rs.10,000/-.

22. The contractor shall comply with the provision of the Apprentices Act. 1961 and the rules and orders issued there under from time to time. If he fails to do so, his failure will be a breach of the contract and the competent authority, may at his discretion, cancel the contract or invoke any of the penalties for the breach on contract provided in the agreement. The contractor shall also be liable to any pecuniary liability arising on account of any violation by him of the provisions of the Act.

'Contractor, shall, during the currency of the contractor ensure engagement by the apprentices in the categories mentioned below who may be assigned to him by the Director of Employment and Training / State Apprenticeship Adviser, Tamil Nadu. The Contractor shall train them as required under the Apprentices Act, 1961 and rules made there under, and shall be responsible for all obligations of the employer under the said act including the liability to make payments to the apprentices as required under the said Act.

Contractor

Executive Engineer, P.W.D.
Technical Education Division-I,
Trichy - 620 020.

Value of contract	Category	No. to be appointed
Rs.1 lakh and upto 3 lakhs	1. Building Constructor	1
	2. Brick Layer	1
Above Rs.3 lakhs and upto Rs.10 lakhs	1. Building Constructor	
	2. Brick Layer	
	3. Diploma Holder in Civil Engineering	1
Above Rs.10 lakhs and upto Rs.50 lakhs	1. Building Constructor	1
	2. Brick Layer	1
	3. B.E.(Civil) or equivalent Degree holder	1

Unless the contractor has been exempted from engagement of apprentices by the Director of Employment and Training / State Apprenticeship Adviser, a Certificate to the effect that "The contractor had discharged his obligation under the said Act Satisfactorily should be obtained from the Director of Employment and Training / State Apprenticeship Adviser and the same should be produced by the Contractor for final payment in the settlement of the contract".

Contractor

Executive Engineer, P.W.D.
Technical Education Division-I,
Trichy - 620 020..

APPENDIX II (a) TENDER

To

Date : .....

His Excellency, the Governor of Tamil Nadu,
represented by the Executive Engineer of
Technical Education Division-I, Trichy-620 020.

Sir,

I/We do hereby tender and, if this tender be accepted undertake to execute the following works, viz. .....
as shown in the drawings and describing in the specifications deposited in the Office of the Executive Engineer of Technical Education Division, with such variation by way of alterations of, additions to, and omission from the said works and method of payment as are provided for in the conditions of contract for the sum of Rupees * ..... or such other sum as may be arrived at under the clause of the General conditions to contract relating to payment on lumpsum basis or by final measurements at unit prices.

2. I/We have also completed the priced list of items in Schedule 'A' annexed (in words and figures) for which I/We agree to/execute the work and receive payment on measured quantities as per the general conditions to the contract.

3. I/We do hereby distinctly and expressly declare and acknowledge that, before the submission of my or our .....
tender, I/We have carefully followed the instructions in the tender notice, and have read the Tamil Nadu Building Practice and the General conditions to the contract therein and the Tamil Nadu Building Practice addenda Volume; and that I/We have made such examination of the contract documents and of the plans, specifications, quantities and of the location, where the said work is to be done, and such investigation of the work required to be done, and in regard to the materials required to be furnished as to enable me/us .....
to thoroughly understand the intention of the same and the requirement, convenants, stipulations and restrictions contained in the contract in the contract and in the said plans and specifications; and distinctly agree that I/We will not hereafter make any claim or demand upon the Government, based upon or arising out of any alleged misunderstanding or misconception or mistake on .....
part the said requirements, convenants, stipulations, restrictions and conditions.

4. ..... Enclose an Income-tax verification certificate .....

I/We being a registered Public Works Department Contractor .....
..... I/We have already produced an income-tax verification certificate during the current calendar year in respect of ..... (here particulars of the previous occasions on which the certificate was produced should be given) The legal address of the contractors for service of all letters and notices will be as follows .....

Contractor

Executive Engineer, P.W.D.
Technical Education Division-I,
Trichy - 620 020.

5. (i) (a) I/We enclose herewith a chalan for the payment of the sum of rupees ..... as earnest money not to bear interest.

5. (i) (b) I/We have paid Rs. ..... (Rupees ..... only) against the EMD of Rs. ..... (Rupees ..... only) since I am/We are, ... and eligible to pay the EMD at concessional rates.

5. (i) (c) In lieu of cash deposits, I/We ..... have enclosed a ..... bearing No. ..... date ..... issued by ..... for a value of Rs..... (Rupees ..... only) drawn/endorsed pledged in favour of the Executive Engineer, Technical Education Division-I, Trichy-620 020.

5. Ii) (d) I am/We are ..... and hence exempted from payment of EMD.

6. If my/our tender is not accepted, this sum shall be returned to me/us on my/our applications when intimation is sent to me/our of rejection or at the expiration of three months from the date of this tender, whichever is earlier. If my/our tender is accepted, the earnest money shall be retained by the Government as security for the due fulfilment of contract. If upon intimations being given to me/us by the authority authorised by the Governor under Article 299(1) of the constitution (hereinafter called the accepting authority) of acceptance of tender (I/We) fail to make the additional security deposit, then I/We agree to the forfeiture of Earnest Money Deposit, Any notice required to be served on me/us, here under shall be sufficiently served on me/us if delivered to me/us personally or forwarded, to me/us by post to (registered or ordinary) or left at any (our address given herein. Such notice shall, if sent by post be deemed to have been served on me/us at the time when in due course of post it would be delivered at the address to which it is sent.

7. I/We fully understand that on receipt of communication of acceptance of tender, from the accepting authority, there emerges a valid contract between me/us and the Governor of Tamilnadu and the tender documents, i.e., tender notice, tender with schedules, General conditions to the contract and special conditions of the tender, negotiations letters, communication of acceptance of tenders shall constitute the contract for this purpose and be the foundation of rights of both the parties, as defined in clause (iv) of tender notice, provided that, it shall be open to the accepting authority to insist on executions of any written agreement by tenderer, if administratively considered necessary or expedient.

8. I/We have also signed the copy of the Tamilnadu Building Practice and National Building code and addenda volume thereto, maintained in the Technical Education Circle Office, in acknowledgement of being bound by all conditions of the clauses of the General conditions to the contract and all specifications for items of works described by a specification number in Schedule 'A'.

Contractor

Executive Engineer, P.W.D.
Technical Education Division-I,
Trichy - 620 020.

9. In consideration of the payment of Rupees ..... or such other sum as may arrived at under the clause of the General conditions to the contract, relating to payment on lumpsum basis or by final measurement at unit prices I/We agree subject to said conditions to execute and complete the works shown upon the said drawing serially from number 1 to ..... inclusive ..... (Schedule B) and described in the specifications (Schedule C) and tothe extent of probable quantities shown in (Schedule A) with such variations by way of alteration or additions to or deductions from the said work and method of payment therefore as are provided for in the said conditions.

10. The term "Executive Engineer" in the said conditions shall mean the public works officer incharge of the Circle having jurisdiction for the time being over the work, who shall be competent to exercise all the powers and previleges reserved herein in favour of the Government with the previous sanction of or subject to ratification by the competent authorities in case where such sanction or ratification may be necessary and who has been duly authorised under Article 299(1) of the Constitution.

11. I/We agree that the time shall be considered as the essence of this contract and to commence the work as soon as this contract is accepted by the competent authority as defined by the Tamil Nadu Public Works Department code and the site (on premises) is handed over to me/us as provided for the in the said conditions and agree to complete the work within ..... months from the date of such handing over the site (or Premises) and to show progress as defined in the tabular statement "Rate of Progress" subject nevertheless to the provision for extention of time contained in clause 56 of the General conditions to the contractor appended to the Tamil Nadu Building Practice.

12. I/We agree that upon the terms and conditions of this contract being fulfilled and performed to the satisfaction of the Executive Engineer, the security deposited by me/us as herein before recited or such portion thereof as I/We may be entitled to under the said conditions be paid back to me/us provided in clause 64 of the General conditions to the contract.

13. I am/We are professionally qualified and my/our qualifications are as follows :

I/We in pursuance of clause 18 of tender notice under take to employ the following technical staff for Supervising the work and will see that one of them is always at site during working hours personally checking all items of works and paying extra attention to such works as may require special attention (e.g.) reinforced cement concrete.

Name of Technical Staff proposed to be employed	*Qualification and Experience*
1.	
2.	
3.	

Contractor

Executive Engineer, P.W.D.
Technical Education Division-I,
Trichy - 620 020.

14. I/We, agree that the arbitrater for fulfilling the duties set forth in the arbitration clause of the General conditions to the contract shall be :

i. The Superintending Engineer of the P.W.D. Territorial Circle in case the value of claim upto Rs.50,000 and

ii. I/We agree that in case, the value of claim is Rs.50,001 and above the remedy willbe through the competent civil court only.

Signature of the Contractor with Date

15. In pursuance of negotiation with the Executive Engineer of Technical Education Division on .....

I/We agree to reduce the rates for the items in the schedule as follows :

Serial Number	*Item Number*	*Schedule*	*Reduced rate per unit*

Date :

Signature of Contractor

16. On behalf of the Governor of Tamilndu and as duly authorised by the Governor under Article 299(1) of the constitution the above tender for a value of Rs..... (Rupees ..... only) is accepted on this day ..... of 199

Signature of the Witness in full and Address with Name in block, letters

Signature and Designation

Contractor

Executive Engineer, P.W.D.
Technical Education Division-I,
Trichy - 620 020.

ANNEXURE TO TENDER NOTICE

SCHEDULE - A

Schedule of rates and Appropriate quantities

(a) The quantities here given are these upon which the lumpsum tender cost of the work is based but they are subject to alterations, omissions, deductions or additions as provided for in the conditions of this contract and do not necessarily show the actual quantities of work to be done. The unit rates noted below are the governing payment of extras or deductions for omissions according to the conditions of the contract as set forth in the General conditions to the contract of the Tamilnadu Building Practice and other conditions or specifications of this contract.

(b) It is to be expressly understood that the measured work is to be taken that (not withstanding any custom or practice to the contrary) according to the actual quantities when in place and finished according to the drawing or as may be ordered from time to time by the Executive Engineer and the cost calculated by measurement or weight, at the respective prices, without any additional charge for any necessary and contingent works connected therewith, the rates quoted are for work in-site and complete in every respect.

Item Number	*Probable Quantity* * *Figures*	*Description of Work*	*TNBP Number Number*
(1)	*(2)*	*(3)*	*(4)*

Rate		Unit words	Amount
Works	Figure (Rs.)		Figures (Rs.)

Date :

Signature of Contractor

The Second sub-division of this Column (i.e.) Column 3 is for entering description in words such as members, cubic metre, Kg. etc.

Contractor

Executive Engineer, P.W.D.
Technical Education Division-I,
Trichy - 620 020.

SCHEDULE - B

LIST OF DRAWINGS

Note :

All drawings to be signed by the contractor as well as the Officer entering into the contract.

Serial Number (1)	Drawing Number (2)	Description (3)

SUPPLEMENTARY LIST

As referred in the specification including the General conditions to the contract of Tamilnadu Building Practice.

Serial Number (4)	Drawing Number (5)	Description (6)	Date on which the drawing was Supplied (7)

Contractor

Executive Engineer, P.W.D.
Technical Education Division-I
Trichy - 620 020

SCHEDULE - C

List of specifications for the various items of works supplementing those described in Schedule-A by standard specification numbers.

1. The Contractor shall employ the following technical staff for supervising the work and shall see that one of them is always at site, during working hours, personally checking all items of works and paying extra attention to such works as may demand special attention e.g. Reinforced concrete work;

Name of the Members of the Technical Staff to be employed	Qualifications

Note :

In case the contractor is himself professionally qualified the above specification should be suitably altered and in cases in which the contractor selected has not given an undertaking to employ qualified men, it should be scored out.

Note :

Additional specifications if any, which have to be entered in Schedule-C, should be entered below held (1) above and Numbered continuously.

Contractor

Superintending Engineer, P.W.D.
Technical Education Circle,
Chennai - 600 025.

Value of Contract	*Qualification and No. of Technical Assistance to be Employed*
1. Upto Rs.1.00 lakhs	No. Technical Assistant need be employed. If situation and nature of work warrants, i. A Diploma holder in Civil Engineerng (or) ii. A retired Junior Engineer may be employed.
2. Rs. 1.00 lakh upto Rs.5.00 lakhs	i. One Diploma holder in Civil Engineering (or) ii. Not less than one retired Junior Engineer
3. Rs. 5.00 lakhs upto Rs.10.00 lakhs	i. One B.E. Civil (or) ii. Equivalent Degree holder (or) iii. Not less than one retired Sub-Divisional Officer / Asst. Exe. Engr. / Asst. Divl. Engr. (or) iv. One Diploma holder with 3 years experience
4. Rs. 10.00 lakhs upto Rs.25.00 lakhs	i. One B.E. (Civil) with 3 years experience plus one Diploma holder in Civil Engineering (or) ii. Equivalent Degree holder with 3 years experience plus one Diploma holder in Civil Engineering (or) iii. Not less than one reired sub-divisional Officer plus one Diploma holder in Civil Engineering (or) iv. Two Diploma holder in Civil Engineering with 3 and 5 years experience respectively
5. Rs.25.00 lakhs upto Rs.50.00 lakhs	i. One B.E. (Civil) with three years experience plus two Diploma holders in Civil Engg. (or) ii. One B.E. (Civil) with three years experience plus two retired Junior Engineers (or) iii. Equivalent Degree holder with 3 years experience plus two Diploma holders in Civil Engineering /Two retired Junior Engineers (or) iv. One retired sub-divisional officer (Asst. Exe. Engr. / Asst.Divnl. Engr.) plus two Diploma holders in Civil Engineering (or) v. One retired sub-divisional Officer (Asst. Exe. Engr. / Asst. Divnl. Officer) plus two retired Junior Engineers.
6. Above Rs. 50.00 lakhs	To be examined in individual cases depending on the nature of work and the technical skill involved and defined in the tender notice regarding the number of qualified technical personnel to be employed by the contractor.

Contractor

Executive Engineer,
P.W.D. Technical Education Division-II
Trichy - 620 020.

B : STEEL

1. Steel to be used on works shall be mild steel medium tensile steel or deformed medium tensile steel bars confirming to IS : 432 (Part-1) - 1966 and IS : 1139 - 1966 as the case may be :

2. Steel shall always be as fresh as possible after manufacure and shall be well and clearly rolled to the dimensions and weights specified. They shall be sound and free from loose dirt, rust, oil paint, grease, cracks, surface flaws, laminations and rough jagged and im perfect edged and other defects. Shed shall be procured from authorised stockists and dealers.

3. Test Certificate for the mechanical (tensile) properties and the unit weight of steel under each category shall be obtained from Government testing laboratories. Facilities available in the Government owned Engineering Colleges and Polytechnic, Building Centre Division and SM & R Division of the PWD my be utilised.

4. Contractor shall notify the arrival of each consignment of steel with particulars such as brand, agent from whom procured and age of the steel.

5. Steel excessively rusted, manufactured from waste steel through the process of re-rolling and not confirming to any of the requirements listed above will be rejected.

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Contractor

Executive Engineer, P.W.D.
Technical Education Division-II
Trichy - 620 020.

IMPORTANT CONDITIONS

1. If rate of any item is omitted to be quoted, the Tender will be rejected.

2. **Mode of remittance of EMD**

Each tenderer must pay as earnest money of a sum of Rs..... (Rupees..... only) in the shape of demand drafts, call / fixed deposit receipts obtained from Nationalised Banks, Small Savings Scripts Deposit Accounts etc. i.e. Post Office savings Bank account or Postal time deposit or National Savings certificates or Indiravikas Patras. The successful tenderer producing EMD in the shape of D.D. or call / FDR will have to convert it into Post Office National Savings Certificate Post Office Savings Bank Account pass book or Post Office time deposit or Indiravikas Patras before conclusion of Agreement. The EMD as indicated above shall be drawn in favour of the Executive Engineer, Technical Education Division.....The EMD not pledged or credited in favour of the Executive Engineer will not be considered.

3. **Revenue Recovery Act.**

Any amount fall on as due from the contractor on account of this contract even after effecting recoveries from the bill for this work entrusted to the contractor will be arranged to be recovered from the contractor under the provisions of the Revenue Recovery Act.

4. **Special Condition for Sales Tax**

All rates quoted in the tender shall be inclusive of Sales Tax, payable under the General Sales Tax Act as amended from time to time (including amended act 28/84) and that the contractor is responsible to file the Sales Tax return and pay the tax amount as demended by the Commercial Tax Department No request for payment of sales tax separately in addition to tendered rates due to any plea of subsequent levy or increase in tax will be entertained vide also clause 38(2) of General conditions to contract.

5. **Mode of recovery measurement for fabrication of MS/TOR for all R.C.C. works**

The actual weight of the steel used for reinforcement will be found out by the actual average weight of the sections used for the purpose, the out bit random samples should be weighed for set, of grill measurement and recorded along with the grill measurements and average section weight recorded. Those should be got check measured by the Asst. Exe. Engineer incharge of the work payment for fabrication of reinforcement grills will be based on that section weight acertained and recorded in the M.Books.

Sub-Clause 26(1) (A) : 26.a.(A) :

The shinkage period of six months referred to in main clause 26(1) above will be five years in respect of all contracts for construction of original buildings either semi-permanent or permanent to on suro structural stability of the buildings.

Sub-Clause 64(1)(A) :

64.1(A) Notwithstanding the above clause, the withheld amount of 2.5% from the final bill in respect of contract for construction of original building will be retained by the Government for a total period of ~~two~~ one years in lieu of six months period referred to in clause 64(1) and will be released after the expoiry of ~~two~~ one years period on execution of an indemnity bond by the contractor to the satisfaction of the Executive Engineer for further period of ~~three~~ four years to ensure structure stability of the building under clause 26(1) (A).

Contractor

Executive Engineer,
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Trichy - 620 020.

7. Validity

The validity of tender is three months from the date of receipt of tender.

8. Water Supply

Only clean fresh water shall be used on the work. The contractor shall pay all fees and provide water and light as required from Municipal mains, other sources and shall pay all charges therefore (including storage tanks, metre etc.) for use on the work and workmen. The special attention of the contractors is drawn to clause 36.1 of preliminary specification of the Tamil Nadu Building Practice Volume II regarding water and lighting. However, in case of necessity at the discretion of the Executive Engineer, the water required for construction purpose will be made available at one point at site of work.

Contractor

Executive Engineer,
P.W.D. Technical Education Division-II
Trichy - 620 020.

OFFICE OF THE EXECUTIVE ENGINEER, P.W.D.
TECHNICAL EDUCATION DIVISION
TRICHY - 620 020.

LIST OF MATERIALS TO BE SUPPLIED DEPARTMENTALLY AND DEPARTMENTAL ISSUE RATES FOR THE SAME

Materials	Rate
1. Cement	Rs.....—/- per metric tonne (Rupess.....—.....only) per metric tonne inclusive of cost empty cement bags. The empty cement of bags are the property of the contractor and they should be handed over to the bag collecting agents as far as possible.
2. Mild steel (or) ribbed for steel required for the work excluding weldmesh	Rs.....—/- (Rupees.....—..... only) per metric tonne.

Note :

No separate charges will be paid to the contractor for unbending and straightening M.S. ribbed tor steel rounds if such rods supplied departmentally happen to be in bent shape or in coils.

3. Binding wire — The contractor is to make his own arrangements for the supply of binding wire required the work.

The above issue rates are inclusive of storage charges at 5%

Contractor

Executive Engineer,
P.W.D. Technical Education Division-II
Trichy - 620 020.

FOR CONTRACTORS SPECIAL ATTENTION

1. Clean river sand shall be used in all cases.
2. Only clean fresh water shall be used on the work. The special attention of the contractor is drawn to clause 39 of Preliminary Specification of the TNDSS regarding water and lighting.
3. The broken stone of concrete and RCC work should be of granite and apssed by the Executive Engineer.
4. All iron work of steel work of every kind except such as to be embedded in concrete shall immediately on arrival at the site be properly scrapped and wire brushed and given a priming coat of approved lead painting without claim for extra.
5. The iron hold faste shall be built up in walls in cement mortar 1:3 at the time of construction of walls. No extra claim shall be due for the same wherever hold fasts are to be provided to g" thick walls. Those should be fixed with cement concrete 1:3:6 using 20mm gauge broken granite stone jelly for proper anchorage and proper binding. No separate rate for such pockets of concrete filling at holdfast points will be allowed and this will be measured as masonry along with adjacent masonry.
6. The teakwood shall be best Indian teakwood only and shall be subject to inspection and approval by the Executive Engineer before use on the work. Country wood where specified shall be of Karimarudu of Kongu for scantling and Aiyini for planks.
7. Holes for electric wiring, water supply and drainage etc., shall be provided as directed during progress of work without any claim for extra.
8. The work will be carried out with the least hindrance to the adjoining building and the contractor will be responsible for any damages, caused to the existing fixtures electric fittings etc. in the course of execution and the contractor shall make good any damage without any claim for extra.
9. In the case of "T" beams and Ell beams, the quantity give in the schedule is the quantity of rib portion only. The top flange portion will be always measured with the general slab portion and paid for at the slab rate only. For all RCC works the rate shall include the treatment of bearing as per plate No.2 of 1946 as per TNDSS (Page 3 of 1964 Edition)
10. Concrete works : All exposed concrete surfaces will be required to be finished by cement plaster as detailed in Schedule 'A'.
11. Plastering : All external corners, edges of beams, edges of doors and window openings etc. shall be finished sharp using richer mortar and also finished truly vertical or horizontal as the case may be. The rate for plastering shall include the cost of finishing as above and no separate extra for the corners, edges, beams, etc. shall be paid.
12. If rates are not separately called for, for similar items of works in different floors, the con tractor should note that one rate is applicable for all floors indicated in the detailed plans. Any claim for extra for such items floor-war will not be entertained under any circumstances.
13. The Executive Engineer reserve the right, to split up the work and entrust the main work, internal water supply and sanitary arrangements to different contractors without assigning any reason therefor.

Contractor

Executive Engineer,
P.W.D. Technical Education Division-II
Trichy - 620 020.

14. The projection if any to the masonry will be measured under the relevant items and not extra will be paid for finishing the same.

15. The work should be executed in accordance with the circular instruction of the Chief Engineer (Buildings) issued from time to time copy of the circular instructions can be purshed in circle office during office hours.

ADDITIONAL SPECIFICATION

1. The arrangement of M.S. rods for all RCC works shall be in accordance with the working drawing supplied.

2. (i) The planks for forms and centering for RCC works shall be of well seasoned timber approved by the Executive Engineer according to clause 10 of TNDSS No.30. Thay must be made smooth and perfectly level at top so as to give smooth and perfectly level at top so as to give smooth and even finish to the RC cellings. Alternatively, the contractor may use steel sheets over wooden forms provided the required finish to the underside of the slab is obtained. Mango planks shall not be used under any circumstances. Centering and form work shall be provided to the extent and area ordered by the Executive Engineer during execution.

   ii. Payments for centering works for all RCC items shall be made only after the concrete is laid, even though separate items for centering works are included in the schedule.

   iii. All cement concrete for RC works shall be machine mixed and vibrated.

   iv. All lime mortar shall be ground in mortar well as per TNDSS.

3. MS and RT steel rods should be cut and placed as reinforment with proper care according to the availanle rods at side so as to ensure the minimum possible wastage.

   a. The cut bits will not taken over by the department.

   b. The maximum percentage of wastage permissible in any size of reinforcement rods shall be of 5%

   c. In respect of wastages that may occur during the execution of work, the contractors shall be allowed a quantity upto 5% over the theoritical requirements and shall be charged only at the issue rate.

   d. For any issue in excess of 5% wastage it should be charged at doulbe fee issue rate.

4. For the quantity of cement used in excess of the theoretical requirements with an allowance of upto 5% for wastage and for the quantity not returned to the department in good conditions, a recovery will be made at two times the issue rate.

ADDITIONAL CONDITION - I

1. The materials noted in the list enclosed will be supplied departmentally at the section stores at site of work and their cost recovered from the contractor's bill at issue rates noted against each.

2. The contractor shall be responsible for the safe custody and storage of the materials under dry conditions at the places of the work-spot approved by the Executive Engineer.

Contractor

Executive Engineer,
P.W.D. Technical Education Division-II
Trichy - 620 020.

3. No royalty shall be charged where due for materials quarried from the Public Works Department or District Board or other Government quarried. Necessary assistance will be given to the contractor by the P.W.D. to obtain access to quarries approved by Executive Engineer. No plot rent shall be charged for materials stacked on the Government land during the course of construction provided all such materials are removed within a month after the work is completed.

4. Royalty or charges due for use of private quarries and private land shall be paid by the contractor.

5. The contractor shall form his own approach road to the work site for which no extra will be due to him. On completion of work, the contractor shall not be permitted to remove the materials laid for formation of road. If the contractor is allowed to use the existing roads, he shall maintain them in good condition at his own cost throughout the period of the contract.

6. Any surplus materials remaining at the site, will not generally be taken over by the department, whether before or after the completion or determination of contract. Such materials either which were originally procured by the contractors or were issued to them by the Department and charged to their accounts, are the property of the contractors and can however be taken over by the department if required, for use on other works which are in progress only by Special arrangements and at the prevailing market rates viz., the rates at which the article or articles of a similar description can be procured at a given time at the stores, godown from Public Market suitable to the division for obtaining supply thereof.

   If the materials were originally used by the Department, the price allowed to the Contractor on re-acquisition shall not exceed the amount charged to the contractor excluding the elements of storage charge if any.

   The surplus materials which were originally issued to the contractor by the department for use on the work shall not be removed from the site of work without getting the written permission of the Executive Engineer.

7. The contractor's special attention is invited to clause 37 and 38 of the preliminary specification of TNDSS and he is requested to provide at his own expenses, shed, latrine and urinal for his workman.

8. If night work is required to fulfill the agreed rate of progress, all arrangements shall be made by the contractors inclusive of lighting without any claim for extra.

9. The contractor shall not employ the labour below the age or 12 years and shall also note that he must offer employment to ex-servicemen, Ex-today tappers and unemployed agricultural labourers as far as possible.

10. Any of the items in the schedule may be omitted or radically altered. No variation in rate shall become payable to contractors on account of such omissions or variation in quantities.

11. Reference to TNDSS in the schedule of quantities referred to reprint 1952 and addenda corrigenda issued thereafter.

12. The construction of the building will be deemed to be complete only if all the items of works including finishing items contemplated herein are executed.

13. The contractor shall abide the contractor's labour regulation of the PW framed by the Tamil Nadu Government.

Encl. : I List of materials to be supplied departmentally
(with issue rates)

Contractor

Executive Engineer,
P.W.D. Technical Education Division-II
Trichy - 620 020.

ADDITIONAL CONDITIONS OF CONTRACT - II

1. The contractor shall at his own expense provide arrangements for the provision of foot wear for any labour doing cement mixing work and all other similar type of work involving the use of tar, mortar etc. to the satisfaction of the Engineer-in-charge and on his failure to do so, the Government shall be entitled to provide same and recover the cost from the contractor.

2. When there are complaints of non payment of wages to the labour, bills of the contractor may be withheld pending a clearance certificate from the Labour Department.

ADDITIONAL CONDITIONS - III

Rules for the provision of Health and Sanitary arragements for workers employed by the PWD and its contractors.

The contractor's special attention is invited to clause 37, 38, 39 and 51 of the preliminary specification to the Tamil Nadu Detailed Standard specification and he is requested to provide at his own expense, the following amenities to the satisfaction of the Executive Engineer.

First Aid

1. At the work site, there shall be maintained in a readily accessible place, first aid appliances and medicines including adequate supply of sterilised dressings and sterilised cotton wool. The applicances shall be kept in a good order. They shall be placed under the charge of a responsible person who shall be readily available during working hours.

Drinking Water

2. (a) Water of good quality fit for drinking purpose shall be provided for the work people on a scale of not less then there gallons per head per day.

   (b) Where drinking water is obtained from an intermittant public water supply, each work place shall be provided with storage tank where such drinking water shall be stored.

   (c) Every water supply and storage shall be at a distance not less than 15 metres from any latrine, drain or other existing well which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly closed if water is drawn from it for drinking. All such wells be entirely closed and be provided with a trap door which shall be dust and water proof.

   (d) A reliable pump shall be fitted to each covered well. The trap door, shall be kept locked and opened only for cleaning or inspection which shall be done atleast onec a month.

Washing Bathing Places

3. Adequate washing and bathing places shall be provided separately for men and women. Such places shall be kept in clear and drained condition. Bathing or washing should not be allowed in or near the drinking water well.

Contractor

Executive Engineer,
P.W.D. Technical Education Division-II
Trichy - 620 020.

Latrines and Urinals

4. There shall be provided within the premises of every work place latrines and urinals in an accessible place and the accommodations separately for each of them shall be on the following scale or on the scale so directed by the Executive Engineer in any particulars case.

i. Where the number of persons employed does not exceed 50 — 2 seats

ii. Where the number of persons employed exceed 50 but does not exceed 100 — 3 seats

iii. For every additional 100 persons — 3 seats

If women are employed separate latrines and urinals screened from those for men shall be provided on the same scale. Except in work places provided with water flushed latrines connected with a water borne sewage system, all latrines shall be provided with acceptable dry earth system which will be cleared atleast four times daily and atleast twice working hours and kept in strictly sanitary condition. The Latrine and Urinals shall be tarred inside and outside atleast once a year.

The excreta from the latrines shall be disposed off at the contractor's expenses, in outside pits approved by the Local Public Health Authority. The contractor shall also employ adequate number of scavangers, conservancy staff to keep the latrines and urinals in a clean condition.

Shelters during Rest

5. At the work site, there shall be provided at free of cost, two suitable sheds one for meals and another for rest for the use of labour.

Creches

6. At every work place at which 25 or more women are working there shall be provided two huts of suitable size for the use of children under the age of 6 years belonging to such women. One hut shall be used for infants, games and play and the other as their bed room. The huts shall be constructed on lower standard then the following.

i. Thatched roofs.

ii. Mud floors and walls.

iii. Planks spread ever the mud floor and covered with matting.

The size of the creche or creches should vary according to the number of women workers. The creches should be properly maintained and necessary equipment like toys etc., should be provided and huts shall be provided with suitable and sufficient sweepers to keep the place clean. There shall be two ayahs in attendance. Sanitary utensils shall be provided to the satisfaction of the Health Officer of the area concerned. The number of the huts shall be restricted to children, their attendants and attendants of the children.

Canteen

7. A cooked food canteen on a moderate scale shall be provided for the benefits of the workers if it is considered expediant.

Contractor

Executive Engineer,
P.W.D. Technical Education Division-II
Trichy - 620 020.

Sheds for Workmen

8. The contractor should provide at his own expense shed for housing the workmen. The sheds shall be on a standard not less then the cheap shelter type to live in which the work pertaining to locality are accustomed to. A floor area of about 1.8m-1.5m for 2 persons shall be provided. The sheds are to be in row with 1.5m clear space between sheds and 24m clear space between row if conditions permit. The work people's camp shall be laid out in units of 400 persons each. Each unit to have clear space of 14.4m around.

ADDITIONAL CONDITION - IV

Safety provision in the building industry - conditions in addition to clause 36 of Preliminary Specification of TNDSS.

PART - I

ARTICLE - 1

1. Suitable scaffolds shall be provided for workmen for all work that connot be safely done from a ladder or by other means.
2. A scaffold shall be constructed, taken down or subsequently altered except.
   a. Under the supervision of a competent and responsible person and
   b. by competent workers possessing adequate experience in this kind of work.
3. Scaffolds shall be so constructed that no part thereof can be displaced in consequence of normal use.
4. Scaffolds shall not be over loaded so far as practicable and shall be evenly distributed.
5. Before installing lifting gear on scaffolds special precautions shall be taken to ensure the strength and stability of the scaffolds.
6. Scaffolds shall be periodically inspected by a competent person.
7. Before allowing a scaffold to be used by his workmen every employee shall, satisfy as to whether the scaffold has been executed by his workmen or not he should take steps to ensure that it functions fully with the requirements of this article.

ARTICLE - 2

1. Working platforms, gangways and staircase shall be so constructed that no part thereof can sag unduly or unequally.
   a. be so constructed and maintained to obviate from risks of person tripping or slipping and
   b. be kept free from any unnecessary obstruction.
   c. Every working platform gangway working place and stir case shall be suitably forced.

Contractor

Executive Engineer,
P.W.D. Technical Education Division-II
Trichy - 620 020.

ARTICLE - 3

1. Every opening in the building or in a working platform shall except for the time and to the extent required to allow the excess of persons or the transport or shifting of materials be provided with suitable means to prevent the fall of persons or materials.
2. When persons are employed on a roof where there is danger of falling from height ex ceeding that to be prescribed by national laws or regulations, suitable precautions shall be taken to prevent the fall of persons or materials.
3. Suitable precautions shall be taken to prevent persons being struck by articles which might fall from scaffolds or other working places.

ARTICLE - 4

1. Safe means of access shall be provided to all working platforms and other working places.
2. Every ladder shall be securely fixed and of such length as to provide secure handhold and foothold at every position at which it is used.
3. Every place where work is carried on and the means of approach there to shall be adequately lighted.
4. Adequate precautions shall be taken to prevent danger from electrical equipment.
5. No material on the site shall be so attached or placed as to cause danger to any person.

PART II
GENERAL RULES AS TO HOISTING APPLIANCES
ARTICLE - 5

1. Hoisting machines and tackle including their attachments enhotages and supports shall
   a. be of good mechanical constructions sound material and adequate strength and free from patent defects and
   b. be kept in good repair and in good working order.
2. Every rope used in hoisting or lowering materials or as a means of suspension shall be suitable quality and adequate strength and free from patent strength.

ARTICLE - 6

1. Hoisting machines and tackle shall be examined and adequately tested after erection on the site and before use and be re-examined in position at intervals to be prescribed by national law or regulation.
2. Every chain ring, hook shackle, swival and pulley block used in hoisting or lowering materials or as a means of suspension shall be periodically examined.

Contractor

Executive Engineer,
P.W.D. Technical Education Division-II
Trichy - 620 020.

ARTICLE - 7

1. Every crane driver or hoisting appliances operator shall be properly qualified.
2. No persons under an age to be prescribed by national laws, regulations shall be in control of any hoisting machinery including any scaffold which, or give signals to the operator.

ARTICLE - 8

1. In the case of every hoisting machine and every chain ring hook, shackle, swival and pully block used in hoisting or lowering or as a means or suspension, the safe working load shall be ascertained by adequate means.
2. Every hoisting machine and all gear referred to in the proceeding paragraphs shall be plainly marked with the safe working load.
3. In the case of hoisting machine having a variable safe working load, each safe working load and the conditions under which it is applicable shall be clearly indicated.
4. No part of any hoisting machine or of any gear referred to in paragraph 1 of this article shall be loaded beyond the safe working load except for the purpose of testing.

ARTICLE - 9

1. Motors gearings, transmission, electric wiring and other dangerous parts of hoisting appliances shall be provided with sufficient safe guards.
2. Hoisting appliances shall be provided with such means as will reduce the risk of the accidental descent of the load.
3. Adequate precautions shall be taken to reduce the risk of any part of a suspended load becoming accidentally displaced.

PART III
GENERAL RULES TO SAFETY EQUIPMENT AND FIRST AID
ARTICLE -10

1. All necessary personal safety equipment shall be kept available for the use of the persons employed on the site and be maintained in a condition suitable for immediate use.
2. The workers shall be required to use the equipment thus provided and the employer shall take adequate steps to ensure proper use of the equipment by those concerned.

ARTICLE - 11

When work is carried on in proximity to any place where there is a risk of drowning, all necessary equipment shall be provided and kept ready for use and sall necessary steps shall be taken for the prompt rescue of any person in danger.

Contractor

Executive Engineer,
P.W.D. Technical Education Division-II
Trichy - 620 020.

ARTICLE - 12

Adequate provision shall be made for prompt first aid treatment of all injures likely to be sustained during the course of the work.

ARTICLE - 13

Where large work places are situated in cities, towns or in their suburban and no beds are considered necessary owing to the proximity of city or town hospital, suitable transport shall be provided to facilitate removal of urgent cases to the hospitals, at their work places, some conveyance facilities such as car shali be kept readily available to the injured person or persons suddenly taken seriously ill to the nearest hospital.

MOSAIC FLOORING

1. Cement concrete flooring tiles shall be manufactured from a mixed cement natural aggregates and colour materials where required by pressure process. During manufacture, the files shall be subjected to a pressure of not less than 140 kg. per sqm. (or 2000 lbs. sq. inch)
2. Proportion of cement to aggregate in backing of the tiles shall be not less than 1:5 by weight.
3. On removal from mould, the tile shall be kept in moist condition continuously for atleast 7 days and subsequently if necessary kept moist for such a longer period that would ensure their conformitly, to the requirements of Transverse, strength, Resistance to wear and tear absorption and would minimise shrinage and cracking, tiles shall be soted under cover.
4. Tolerance : Tolerance on length and breadth shall be plus or minus one millemetre. Tolerance on thickness shall be plus 5 mm. But the range of dimensions any in one delivery of tiles shall not exceed 1 mm of length and breath and 3 mm on thickness.

THICKNESS OF WEARING LAYERS

Class of tiles	Minimum thickness of wearing layer
Plain Cement and Plain coloured tiles for general duty	3
Plain Cement and plain coloured tiles for heavy duty	6
(Mosaic) terrace tiles with chips of size varying from the smallest upto 6 mm (1/4")	5
(Mosaic) terrace tiles with chips of size ranging from the smallest upto 12 mm (1/2")	5
(Mosaic) terrace tiles with chips of size varying from the smallest upto 20 mm (3/4")	6

Contractor

Executive Engineer,
P.W.D. Technical Education Division-II
Trichy - 620 020.

6. **Colours and Appearance :** The colour and texture of the wearing layer shall be uniform throughout its thickness.

7. When specifying the tiles, the contractor should specifically indicate whether the chips to be used are from the smallest units 6 mm or from smallest upto 12 mm or from the smallest upto 20 mm size. The officers of the department shall also specify size of chips by referring the approximate photograph given in figure 4 to figure 6 in Indian Standard 1237, 1959.

GENERAL QUALITY OF TILES

8. Unless otherwise required the wearing face of the terrace tiles shall be mechanically sound and flat. The wearing face of the tiles shall be reasonably parallet to the backface of tiles. All angle shall be right angles and all edges shall be sharp and true.

9. Breaking Traverse strength of tile shall be given as below :

Size of Titles	Span	Breaking wet test	Load based dry test
19.85 x 19.85 cm	15 cm	71 kg.	106 kg.
24.85 x 24.85 cm	20 cm	90 kg.	120 kg.
29.85 x 29.85 cm	25 cm	90 kg.	149 kg.

10. The average wear of not less than 12 specimens shall not exceed 2 mm and the wear on any individual specimen shall not exceed 2.5 cm when tested in an abrasion Machine.

11. The average percentage of water absorption shall not be less than six full tiles shall not exceed ten in the case of water obsorption test.

12. The density of the tiles shall be in the order of about 2.4gms. The tiles shall be laid with the minimum possible width of joint and not exceeding 1/32 inch. The joints shall be filled with grey cement to match the finish of the tiles and shall be made almost invisible when the floors is given the final polish. The polishing shall be done by means of electric polisher wherever possible and hand polish to other places like vertical faces, or walls, covers and other areas where the machines can have no access and to a high degree so as to present a perfectly smooth and glossy surface as even as possible.

    All angles at junctions of vertical faces shall be rounded of to 1 1/2" radius with same quality of materials and colour of the tiles of the floor. But laid in situ and these coves shall be measured as part of flooring and laid for at the same rates as the flat floors. The colours of the tiles shall generally match other coloured face adjacent or as may be directed by Executive Engineer.

    The dadooing and skirting have to be finished by giving necessary recess in the brick wall itself so that the projections does not exceed 3/4" from the face of the wall i.e. the finished plastered surface.

    Based on the modules of repture of 30kg. per sq.m. for dry test and two thirds of the value for wet test.

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GUIDELINES FOR ADOPTION OF STRENGTH GRADENING OF CONCRETE

Plain and reinforced concrete have been graded according to the cube compressive strength and designated as M100, M150, M300, M350 and M400. In the designation of concrete the letter

"M" refers to the mix and the "Number" to the specified 28 day work cube compressive strength of that mix expressed in kg.cm2

Approximately the M100, M150, M200, M250 grades of concrete corresponds to 1:3:6, 1:2:4, 1:1 1/2:3, and 1:1:2 nominal mixes of ordinary concrete currently used. The national Building code gives necessary specification for strength gradening of concrete, proportionately and works control and the same may be followed the extract of the same is enclosed.

The proportion of aggregates, cement and water to be used for controlled concrete shall be designed by preliminary tests of the material to be actually used to obtain the specified strength with the use of maximum quanity of cement. However, the maximum total quanity of aggregate by weight per 50 kg of cement shall not normally exceed 450 kg.

For any particular item compressive strength required to be obtained by the concrete at 28 days in the preliminary and work tests on the 15 cum cubes, minimum cement content required to be used and the approximate proportions of approved fine and coarse aggregates shall be specified in the tender schedule. These particulars will be only for the guidance of the contractor for quoting rates.

Immediately upon the receipt of the award of contract, the contractor shall inform the Executive Engineer the exact location of the sources of the materials which he proposes to use and get the materials approved. The mix with the actual approved materials to be used be got designed in an approved laboratory by the contractor with minimum quanity of cement to give the specified strength in the preliminary tests and the proportions got approved from the Executive Engineer in writing. These proportions shall be used to long as the materials continue to be of the same quality and the same sources subject only to slight changes in the relative qualities of fine and coarse aggregate for the purpose of promoting workability, provided the works tests also show the required strengths.

If during the progress of work, the contractor wishes to change the materials, the proportions shall be fixed on the basis of fresh preliminary tests to give the required strength after the executive Engineer is satisfied that the materials satisfy the specification, No adjustments of cost shall be made for change of proportions of cement fixed in the original preliminary tests.

PROPORTIONING OF MIX

Each batch of mix shall be proportioned by weight of cement fine aggregate and coarse aggregate. Water for each batch shall be added in quanity measured by volume or by weight. Where weight of cement dtermined by accepting the maker weight per bag, a reasonable number of bag shall be weighed separetly to check the nett weight , and the cement is weighed weight per bag, a reasonable number of bags shall be weighed on the site and not in bags. It shall be weighed separately from the aggregate. All the weighing equipments shall be maintained in a clean and serviceable condition and their accuracy checked periodically.

MIXING

Mixing shall be done only by mechanical mixes. The quantities of fine aggregate and water shall be adjusted duly in the field, to compensate for bulkage due to the quanity of moisture present in fine aggregate and free water in the coarse aggregate at the time of use.

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TESTS

Tests shall be got done in an approved laboratory, at the cost of the contractor.

A. Preliminary Test

If concrete mixes are specified by its strength then the mix needs be desinged and preliminary test should be carried out.

(a) Designing a concrete mix before the actual concree operation starts.

(b) Determining the adjustments required in the desinged mix when there is a change in the materials used during the execution of works or.

(c) Verifying the strength of cement mix.

B. Works Tests

The test shall be conducted either in the field or in a laboratory on the samples made on the workspot of the concrete used on the works.

The samples shall be spread as evenly as possible throughout the day then wide changes of weather conditions occur during concreting additional sample may be taken as desired by the Executive Engineer.

All expenses on the tests shall be borne by the contractor. Nothing extra shall be paid to the contractor for carryingout the tests.

All samples or tests shall be taken in the presence of the Assistant Engineer concerned and the contractor or his authorised agent.

All mix design and test data and results shall be maintained as part of the record for the contract and shall be signed by the Assistant Executive Engineer and the contractor.

A Register of cement concrete cubes cast and tested giving the following particulars shall be maintained at the site.

1. Name of work and reference to agreement.
2. Serial No.
3. Data and time of sample taken.
4. Sample No.
5. No. of Cube.
6. Identification Marks.
7. Proportions of Mix.
8. Description of the portion of work represented by the sample and quantity of concrete represented by the sample.
9. Initials of Assistant Executive Engineer and contractor's authorised agent in whose presence the sample is taken.
10. Result of 7 day test.
11. Result of 28 day test.
12. Review and remarks by Executive Engineer.

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EXTRACT OF :

NATIONAL BUILDING CODE OF INDIA 1970

PART VI-SECTION 5A : PLAIN AND REINFORCED CONCRETE

4.2. Grades of concrete.

4.2.1. Plain and reinforced concrete shall be in seven grades designated as M100, M150, M200, M250, M300, M350 and M400.

Note : In the designation of a concrete mix, letter 'M' refers to the mix and the number of the specified 28 days works cube compressive strength of that mix expressed in kg/sq.cm.

4.2.2.1. Where ordinary portland cement or Portland blast furnace slag cement conforming to accepted standards VI-5(2)* is used. The compressive strength requirements for various grades of concrete shall be as given in Table I. Where rapid - hardening Portland cement is used, the 28 day compressive strength requirements specified in Table I shall be met at 7 days. Where other cements are used, the Engineer-in-charge shall specify the corresponding requirements preferably on the basis of preliminary tests.

*IS 269/1967 - Specification for ordinary, rapid hardening and low heat portland cement.

4.2.2.2. The strength requirements specified in Table I shall apply to both controlled concrete and ordinary concrete (See 4.3.1) Preliminary tests need not, however, be made in the case of ordinary concrete.

a. In order to get a relatively quicker idea of the quality of concrete, optional works tests on beams for modulus of rupture at 72+2 hours or at 7 days, or compressive strength tests at 7 days may be carried out in addition to 28 day compressive strength tests. In all cases the 28 day compressive strength specified in Table I shall alone be the criterion for acceptance or rejection of the concrete. If however from tests carried out in a particular job over a reasonably long period, it has been established to the satisfaction of the Engineer-in-charge that a suitable ratio between the 28 day compressive strength and the modulus of rupture at 72+2 hours or at 7 days or compressive strength at 7 days may be accepted. The Engineer-in-charge may suitably relax the frequency of 28 day compressive strength test specified in Table 5 provided the expected strength values at the specified early age are consistently met. For this purpose the values given in Table 2 may be taken for general guidance in the case of concrete made with ordinary cement.

b. Where the strength of a concrete mix, as indicated by tests lies between the strength for any two grades specified in Table I, such concrete shall be classified for all purposes as a concrete belonging to the lower of the two grades between which its strength lies.

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4.3. PROPORTIONING AND WORKS CONTROL :

4.3.1. Methods of proportioning - The determination of the proportions of cements aggregates and water to attain the required strength shall be made by one of the following :

a. With preliminary tests by designing the concrete mix. Such concrete shall be called "Controlled Concrete".

b. Without preliminary tests by adopting nominal concrete mixes. Such concrete shall be "ordinary concrete".

4.3.2. CONTROLLED CONCRETE :

4.3.2.1. As far as practicable, controlled concrete should be used on all concrete works. Controlled concrete for use in plain and reinforced concrete structures shall be in grades M100, M150, M200, M250, M300, M350 and M400.

4.3.2.2. The concrete mix shall be designed to have an average strength corresponding to the values specified for preliminary tests in Table I. The proportions chosen should be such that the concrete is of adequate workability for the conditions prevailing on the work in question, and may be properly compacted with the means available.

The maximum total quantity of aggregate by weight per 50 kg. of cement shall not exceed 450 kg. except where otherwise specifically permitted by the Engineer-in-charge.

4.3.2.3. Except where it can be shown to the satisfaction of the Engineer-in-charge that supply of properly graded Aggregate of Uniform quality may be maintained over the period of work, the grading of aggregate should be controlled by obtaining the coarse aggregate, in different sizes and blending them in the right proportion when required the different sizes being stocked in separate stock piles. The materials should be stock piled for several hours preferably a day before use. The grading of coarse and fine aggregate should be checked as frequently as possible, the frequency for a given job being determined by the Engineer-in-charge to ensure that the suppliers are maintaining the grading uniform with that of the sample use in the preliminary tests.

4.3.2.4. In proportioning concrete, the quantity of cement should be determined by weight. where the weight of cement is determined by accepting the manufacturer's weight per bag, a reasonable number of bags should be weighed separatelly to check the nett weight. Where the cement is weighed on th site and not in bags it should be weighed separately from the aggregates. Whater should be either measured by volume in calibrated tanks or weighed. All measuring conditions, and their accuracy may be periodically checked.

4.3.2.5. It is most important to maintain the water - ratio constant at its correct value. To this end, determination of moisture contents in both fine and coarse aggregates should be made as frequently as possible the frequency for given job being determined by the Engineer-in-charge according to weather conditions. The amount of the added water should be adjusted to compensate for any observed variation in the moisture contents. The determination of moisture content in the aggregate shall be carried out in accordance with good practice (VI-5-9) IS 2386 Part III 1963. To allow for the variation in weight of aggregates due to variation in their moisture content suitable adjustement in the weight of aggregate should also be made.

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4.3.2.6. No substitution in materials used on the work or alteration in the established proportions except as permitted in 4.3.2.5. shall be made without additional tests to show that the quality and strength of concrete are satisfactory.

4.3.2.7. Workability of the concrete should be checked at frequent intervals. The slump test or where facilities, exist the compacting factor test conducted in accordance with good practice {(VI-5(10) } may be adopted for this purpose.

4.3.2.8. A competent person should be employed whose first duty will be to supervise all stages in the preparation and placing of the concrete. All works test specimen should be made and site tests carried out under his direct supervision.

4.3.3. ORDINARY CONCRETE

4.3.3.1. Where it is considered not practicable to use controlled concrete, ordinary concrete may be used for concrete of grades M100, M150, M200, M250. The proportions of materials for nominal concrete mixes for ordinary concrete shall be in accordance with Table 3.

4.3.3.2. In proportioning concrete, the quantity of cement should be determined by weight. The quantities of fine and coarse aggregates may be determined by volume but these should also preferable be determined by weight. In the latter case, the weight per litre of dry aggregate. If fine aggregate, is moist and volume batching is adopted, allowance shall be made for buling in accordance with good practice (VI-5(9)*.

4.3.3.3. The water cement ratio shall not be more than those specified in Table 3.

The cement content of the mix specified in Table 3 for any nominal mix may be increased if the quantity of water in a mix has to be increased to overcome the difficulties of placement and compaction, so that the water cement ratio specified in Table 3 is not exceeded.

Note 1 : In the case of vibrated concrete, the limit specified may be suitably reduced to avoid segregation.

Note 2 : The quantity of water used in the concrete mix of reinforced concrete work should be sufficient, but should not be more that what is sufficient to produce a dence concrete of adequate, workability for the purpose, which will surround and properly grip, all the reinforcement, workability of the concrete should be controlled by maintaining a water cement ratio - that is found to give a concrete which is just sufficiently wet to be placed and compacted without difficulty with the means avail able.

4.3.3.4. Workability of the concrete should be controlled by direct measurement of water content, making allowance for any surface water in the fine and coarse aggregates. The slump test maybe conducted in accordance with good practice {(VI-5-(10)}*

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4.3.3.5. Allowance should be made for surface water present in the aggregate when computing the water content. Surface water shall be determined by field methods in accordance with good practice (VI-5) (9)*. In the absence of exact data the amount of surface water may be estimated from the values given in Table 4.

4.3.3.6. If ordinary concrete made in accordance with the proportions given for a particular grade does not yield the specified strength due to proper qualities of materials not being available, such concrete shall be classified as belonging to the appropriate lower grade.

Ordinary concrete proportioned for a grade given in accordance with Table 3 shall not however, be placed in a higher grade on the ground that the test strengths are higher than the minimum specified. No interpolation shall be permissible.

4.4. Sample size and acceptance criteria.

4.4.1. All test shall be carried out in accordance with good practice {(VI-5-(4)}

4.4.2. The number of test specimens required, the frequency of sampling and the criteria for acceptance of a concrete as conforming to the specified grade shall be in accordance with Table 5 for both ordinary concrete and controlled concrete. No preliminary tests are, however, necessary in the case of ordinary concrete.

IS 1 199-1959 Methods of sampling, and analysis of concrete.

IS 2386 (Part III) 1963 specific gravity, density, voids absorption and bulking Methods of tests for aggregate for concrete.

IS 516 - 1959 Methods of test for strength of concrete.

TABLE I
STRENGTH REQUIREMENTS OF CONCRETE
(Clauses 4.2.2.1 and 4.2.2.2.)
(All values in kg/cm²)

Compressive strength of 15cm cubes at 28 days after mixing conducted in accordance with good practice {(VI-5(4)}

Grade of Concrete (1)	Preliminary Test Min. (2)	Works Test Min. (3)
M 100	135	100
M 150	200	150
M 200	260	200
M 250	320	250
M 300	380	300
M 350	440	350
M 350	440	350
M 400	500	400

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Note 1 : Preliminary Test*: A test conducted in a laboratory on the trial mix of concrete produced in the laboratory with the object of

a. Designing a concrete mix before the actual concreting operation starts.

b. Determining the adjustments required in the designed mix when there is a change in the materials used during the execution of work. or.

c. verifying the strength of concrete mix.

Note 2 : Works Test : A test conducted either in the field or in laboratory on the specimens made on the works, out of the concrete being used on the works.

Note 3 : Size of Cubes : In the working test, with the approval of the Engineer-in-charge 10 cm cubes may be used in place of 15 cm cubes provided the maximum nominal size of aggregate does not exceed 20 mm. Even the use of 15cm cubes should normally be restricted to concrete having a maximum nominal size of aggregate not exceeding 40mm. Where concrete with aggregates larger then 40 mm size is required to be tested, the size of cubes should be specified by Engineer-in-charge, keeping in view that generally the length of side of the cube should be about four times the maximum nominal size of aggregate in the concrete constituting the cube specimen.

Note 4 : Strength in Relation to Size of the Cube : Where 10cm cubes are used, the values obtained from tests on 10cm cubes shall be reduced to the extent established by comparative preliminary tests with 10 and 15 cm cubes, or in the absence of such comparative tests, by 10 percent of the value determined from the tests, in order to give the equivalent strength for 15cm cubes; when cubes larger than 15cm are adopted, generally no modification is necessary unless otherwise specified by the Engineer-in-charge.

IS 516-1959 - Methods of test for strength of concrete.

Note 5 : Cylinder strength - Compressive strength test may, with the approval of the Engineer-in-charge, be conducted on 15cm diameter ad 30cm high cylinders in accordance with good practice [VI-5(4)*] instead of one cube, where cylinder strength figures are adopted, the compressive strength figures given above shall be modified according to the formula, Minimum cylinder compressive strength requires, 0.8 compressive strength specified for 15cm cubes.

The CENTRAL ROAD RESEARCH INSTITUTE, New Delhi has carried out tests with a view to establishing a relation between water cement ratio and the compressive strength of concrete using ordinary Portland cements manufactured in the country conforming to accepted standards. [VI-5(2)]**.

As a result of these, it has been considered advisable to give graphs showing the relationship between the compressive strength of concrete mixes with different water cement ratios and the 7 day compressive strength of cement tested in accordance with good practice [VI-5(2)**.] These graphs have been given in Appendix-A as they would be of some assistance in obtaining the water cement ratio for trial mixes of concrete.

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TABLE 2
OPTIONAL WORKS TEST REQUIREMENT OF CONCRETE
Clause 4.2.2.2. (a)
(All values in kg/cm²)

All test shall be conducted in accordance with good practice [VI-5(4)*].

Grade of concrete (1)	Compressive strength on 15cm cubes Min. at 7 Days (2)	Modulus of Rupture by beams test	
		At 72 ± 2 Hours (3)	at 7 days (4)
M 100	70	12	17
M 150	100	15	21
M 200	135	17	24
M 250	170	19	27
M 300	200	21	30
M 350	235	23	32
M 400	270	25	34

Note : Notes 3 to 5 under table 1 are also applicable to this table.
* IS 516-1959-Methods of test for strength of concrete.
** IS 269-1967-Specification for ordinary, rapid, hardening and low heat portland cement.

TABLE 3
CONCRETE MIX PROPORTIONS
(Clause 4.3.3)
Ordinary concrete

Grade of concrete (1)	Total quantity of dry aggregate by volume per 50kg. of cement to be taken as the sum of the individual volumes of fine and coarse aggregates Max. (2)	Proportion of fine aggregate to coarse aggregate (3)	Quantity of water per 50 kg. of cement Max. (4)
M 100	300	Generally 1:2 for fine aggregate to coarse aggregate by volume but subject to an upper limit of 1:1:5 and a lower limit of 1:3*	32
M 150	220		30
M 200	160	--	27
M 250	100	--	

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Note : It may be noted for general guidance that M 100, M 150, M 200 and M 250 of ordinary concrete correspond approximately to 1:3:6, 1:2:4, 1:1.5:3 and 1:1:2 nominal mixes of ordinary concrete currently used in the country.

* The proportions of the aggregates should be adjusted from upper limit to lower limit progressively as the grading of the fine aggregates becomies finar and the maximum size of coarse aggregate becomes larger. Example, for an average grading of fine aggregate that is, zone II in accordance with good practice [VI-5(1)] the proportion shall be 1:1.5, 1:2 and 1:3 for maximum size of aggregate 10mm, 2omm and 40mm respectively.

TABLE 4

SURFACE WATER CARRIED BY AVERAGE AGGREGATE

Aggregate (1)	Approximate quantity of surface water (2) l/m³
Very wet stand	120
Moderately wet stand	80
Moist sand	40
* Moist gravel or crused work	20 to 40

* Coarser the aggregate, less the water it will carry.

IS 383-1963 Specification for coarse and fine aggregates for natural sources for concrete.

IS 516-1959 Specification for natural and manufactured aggregates for use in mass concrete.

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ACCEPTANCE CRITERIA FOR CONCRETE (ALL GRADES)

PRELIMINARY TEST				WORKS TEST						
Min. No. of specimens from each Batch (Cubes)		Minimum frequency	Criteria for acceptance	Minimum No. of specimens taken from the same day's work (Cubes)			Beam	Minimum frequency		
7 day compressive Strength test as an optional test if desired	28 day compressive Strength test			7 day compressive Strength test as an optional test, if desired	28 day compressive strength test	72 + 2 hours test as an optional test, if desired	7 day test as an optional test if desired	In terms of the quantity of concrete	In terms of period	Criteria for acceptance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
5	5	For each batch with a minimum of three batches.	Accept if average compressive strength of the specimens tested is not less than the compressive strength specified in Table 1 (For optional tests, see Table 2) subject to the condition that only one out of 5 consecutive tests may give a value less than specified strength.	3	3	3	3	For every 150m of concrete or part thereof	At such intervals as the Engineer-in-charge may decide. However, in the case of controlled concrete, samples shall be drawn on each day for the first 4 days of concreting and there after atleast once in 7 days of concreting	Accept if average strength of specimens tested is not less than the strength specified in table 1 (for optional tests see table 2) subject to the condition that only one out of 3 consecutive tests may give a value less than specified strength but this shall not be less than 90% of specified strength.

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	10	For each batch with a minimum of three batches	Accept if average compressive strength of the specimens tested is not less than the compressive strength specified in Table 1 subject to the condition that the average compressive strength shall be more than the specified compressive strength in Table 1 by atleast the value of Standard Deviation * of the series of the test.	5	5	5	5	For every 150m of concrete or part thereof	At such intervals as the Engineer in-charge may decide. However, in the case of controlled concrete, samples shall be drawn on each day for the first 4 days of concreting and there after atleast once in 7 days of concreting	Accept if average strength of specimens tested is not less than the strength specified in Table 1 (for optional tests see table 2) subject to the condition that one out of Five consecutive tests may give a value less than the specified strength.

* Standard Deviation = $\sqrt{\frac{\Sigma d^2}{n-1}}$ where d = individual deviation from the average, and n = number of specimens tested.

Empty Cement bags : The empty cement bags are the property of the Contractor and they shall be returned to the bag collecting agents as far as possible

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Contractor

SPECIFICATION FOR SANITARY, DRAINAGE AND WATER SUPPLY ARRANGEMENTS

1. Water closets, basins, urinals, sinks and other sanitary were shall be approved Indian make as required in the relevant items. The fixing of these shall be in accordance with the special specification attached.

2. The tests shall include all dismantling,making holes in walls or slabs, and restoring he structure to the original condition after the completion of the work.

3. The work shall be carried out with least hindranie to the adjoining buildings and the contractor shall be responsible for any damage caused to the existing fixtures, electric fittings etc. in the course of execution and the contractor shall make good such damage without claim for extra.

4. The rates for laying stoneware pipes shall include necessary earth work excavation for trenches (irrespective of nature of soil and depth) and all incidental charges such as shoring, strutting and bailing out water, refilling trenches after the completion of work and consolidating, removing the surplus earth to places shown within the compound and making good the damages to read and other structures.

5. The rates for laying G.I. Pipes shall include earth work for trenching and refilling them and fixing with wooden plugs, clamps and screws where the pipes are fixed to walls. The rates for G.I. Pipes shall also include wrapping them with tarred tape where they are burried in earth tarring the portions embedded in masonry and painting with white paints two coats for portions above ground level.

6. The clamps for G.I. Pipes, fittings should not be spaced more than 150mm. apart. The wooden plugs for pipe and bracket fittings should be properly fixed in C.M. 1:3 in holes made in masonry with the wide and wedge shaped plugs inside and not hammerred with them and into walls. The size of plugs should not be less then "Squarrat" this end and 12mm at the other end with a depth not less than 75mm.

7. New sewer and drains should pass a hydraulic test of not exceeding 3.60 metres at the lowest end.

8. Where a new sewer line is connected to an existing manhole rates quoted shall include necessary excavation dismantling masonry refilling and redoing the disturbed portions as directed without claiming any extra for these.

9. (a) Paint with two coats of best white glazed paint or any other colour approved by the Executive Engineer over a priming coat of Red lead to all flusing tanks, brackets, clamps used for fixing pipes and all lead connections.

   (b) Painting with two coats of anti-corrosive paint of approved colour to all G.I. soil waste and anti-syphone pipes.

10. The rates shall include all dismantling making holes in walls or slabs and restoring the structure to the original condition after the completion of the work.

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SUPPLYING AND FIXING INDIAN TYPE WATER CLOSETS

11. The Indian Type water closet shall be with 'P' or 'S' trap and glazed earthern ware foot rests. It shall be fixed in position of floor level in a bed of concrete brick jelly in lime mortar so as to completely embed the closet, trap and foot rests. The existing masonry structure after dismantling the floor making holes etc. shall be restored to its original conditions after the completing the work. The flooring round the closet shall be finished off in cement mortar with adequate slope alround for draining into as per the sanitary Engineer's type design.

12. The cast iron flushing tank shall be of 15 litres capacity of Indian make supported on C.I. brackets with necessary G.I. chains and hands for pull, float ball valve 6mm lead and brass connection to the closet including necessary connection to the water main and closet complete and wiped solder joints. The flushing tanks and brackets must be painted with white glazed enamel paint 2 coats over a priming coat of red lead. The water closet rooms should be made upto the foot rest level wherever necessary with brick jelly concrete in lime morter 1:2.

SUPPLYING AND FIXING EUROPEAN TYPE WATER CLOSETS

13. The water closet shall be glazed earthernware with 'P' or 'S' trap including PVC seat and cover and chromium plated fittings 15 litres Indian make glazed earthernwater flushing tank supported on C.I. Brackets with necessary handle for pull float ball valve 12mm G.I. telescopic flush pipe connections to the closets including necessary wiped soler joints complete.

14. The fixing of water closets shall include the dismantling of existing floor wherever Indicated making holes in masonry walls etc. and restoring structure to original condition after completion of the work. The flushing tank and accessories will be fixed to the walls with necessary clamps and brackets in C.M. 1:4.

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