COVER – II

GOVERNMENT OF TAMILNADU
TECHNICAL EDUCATION CIRCLE
CHENNAI – 600 025.

NAME OF WORK: **Construction of Building for Government Arts and Science College at Srivilliputhur in Virudhunagar District**

EMD AMOUNT : Rs. 4,99,000/-

DATE OF TENDER : 08.07.2022

Contractor

FOR SPECIAL ATTENTION OF THE CONTRACTOR

1. Proof of Registration in PWD & Technical Education as a contractor shall be attached with the tender.

2. Current income tax clearance certificate, copy of latest I.T. return with audit certificate shall be enclosed along with the tender.

3. Bank Guarantee will not be accepted towards Earnest Money Deposit.

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 past Five 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 the Pert Chart. The Pert Chart shall confirm 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 document will be issued to the contractors who were registered their names as contractors in P.W.D. or Technical Education in the appropriate class only.

Name of the Contractor & Address:

Contractor

Important instructions to the Tenderers

1. Tenderers should quote rates both figure and in words.

2. The value of work for each and every item in the schedule and total amount must be furnished without fail.

3. The conditional tender should affect the value of contract such as giving rebate in particular page or at the end of the schedule should not be permitted.

4. The rates quoted in the tender shall include, all charges including State Tax, Central Tax etc. Furnishing of taxes in addition to the rates quoted in the tender schedule could not be taken and tender should be summarily rejected at the time of opening of tender itself.

5. The spiral binding of tender documents and other credentials of contractors should not be permitted. The documents should be in the shape of stitched one in the neat wrapper sheet.

6. The tender cover must be properly closed using quality paste and should be in sealed cover. Using cello tapes and stapler pins to close the covers should not be taken into account and during initial examination itself the tender will be rejected.

7. The tenders not received in the above manner will be rejected at the time of opening of tender itself.

Sales Tax Clause

At the time of payment of such sum, deduction at 2% in respect of Civil works and 4% in respect of all other works contract, from the total amount payable to the contractors and the amount so deducted shall be deposited to the Assessing officer concerned with in seven days.

Additional Security Clause

Contractor

On evaluation of tender if it is found that if the overall quoted amount of the tender is less than 5 to 15% of the value put to tender, the contractor shall pay additional security at 2% of the estimated value.

If the tender discount exceeds 15% to 20%, the contractor shall pay an additional security deposit of 50% of the difference between the quoted amount and estimated amount. Failure to furnish the additional security deposit within 15 days from the date of receipt of acceptance order and execute the agreement shall entail cancellation of award of contract and forfeiture of E.M.D. amount.

SPECIAL INSTRUCTIONS TO THE TENDERERS

1. The tenderer should carefully go through the tender schedules and quote their rates for all items and alternative items also.

2. The rates should be filled in neatly in figures and words and taking into account the metric unit specified in the tender, Scrubbing, over-writing and erasing 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 done under 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.

5. 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).

    i. Details of the Earnest Money Deposit remitted in the form of Demand Draft in favour of Executive Engineer concerned and N.S.S., N.S.C., post office savings pass book duly pledged in name of Executive Engineer concerned in which the Earnest Money Deposit was paid.

    ii. In case the tenderers are eligible for confessional 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.

    iii. 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.

    iv. Details of previous work done by the tenderers covering the cost of 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.

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

vi. 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.

vii. The tenders must be submitted in a foolscap cover thereby duly signed all the conditions, plans and Schedules issued as Tender documents.

TENDER NOTICE

1. On behalf of Governor of Tamil Nadu, tenders will be received by the Chief Engineer, PWD, Technical Education Circle at his office at Chennai 600 025 upto 3.00 p.m. on **08.07.2022** for the work of

Construction of Building for Government Arts and Science College at Srivilliputhur in Virudhunagar District

The tender should be in the prescribed form obtainable from the Chief Engineer office.

The tenders will be opened by the Chief Engineer, PWD, Technical Education Circle at 3.30 p.m. at the place and on the date aforementioned.

The tenderer or their agents are expected to be present at this time of opening of tenders. The tender receiving officer will, on opening each tender, prepare a statement of the attested and unattested correction 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 find it inconvenient to be present at the time, then in such a case, the tender receiving officer will, on opening the tender of 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 questions whatsoever.

2. Tenders must be submitted in sealed covers and should be addressed to the Chief Engineer, PWD, Technical Education Circle in the name of the tenderer and the name of the work being written 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 authorized officer who shall produce with his tender, satisfactory evidence of his authorization. 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 partner 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 calendar year, in which 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 as aforementioned will be summarily rejected.

4. Each tenderer must pay, as earnest money, a sum of **Rs. 4,99,000/- (Rupees Four lakhs ninety nine thousand only)** N.S.S., N.S.C., post office savings pass book duly pledged in name of the Executive Engineer concerned or D.D. in name of the Executive Engineer concerned from Nationalised Schedule Banks. The Earnest money 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. The 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 three months from the date of tender, whichever is earlier. The refund will be authorised by the Chief / Superintending Engineer. The earnest money will not be received in cash or currency notes by the Public Works Department Officer, at any cost.

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

5. The tender will remain valid for a 90 days (Ninety Days) from the last date of receipt of tender. The validity period can be extended further if the contractor gives his consent in writing, specifying the period of extension.

i). The tenderer whose tender is under consideration shall attend the Chief Engineers Office, before the end of the period specified by written intimated 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 intimation being given to him of acceptance of his tender by the officer duly authorized in this behalf under the article 299 (i) of the constitution, hereinafter called the accepting authority "make security" deposit of 2 percent of the value of contract in one of the form prescribed in Tamil Nadu Public Works Accounts 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 amount 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 fulfillment 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 back out from the tender, or withdraw his tender, the Earnest Money Deposit shall be forfeited to the Government.

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

v). 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 Government of Tamilnadu 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 contractor, General condition to the contract, special condition 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 of expedient.

6. The tenderer shall examine clearly the Tamil Nadu Building Practice and also general condition to contract contained therein, and sign the Circle Office copy of the Tamil Nadu Building Practice and its agenda volume in token of such study before submitting his tender unit rate, which shall be for finished work in-situ. He shall also carefully study the drawings and additional specification and all the documents connected with the contract. The Tamil Nadu Buildings 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. to 5.45 p.m. on office days in the Office of the Chief Engineer, Technical Education Circle, Chennai 600 025. A copy of the set of contract documents can also be had on payment of **Rs. 16,800/-**for each set.

7. The tenderer attention is directed to the requirements for materials under the clause “materials and Workmanship” and the general conditions to the contract. Materials conforming to the Indian Standard Specification shall be used on the work and the tenderer shall quote his rates accordingly.

8. Every tenderer is expected before quoting his rates to inspect the sites 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 kins etc., where form 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, of materials as called for in the stand 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 the 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 of 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.

Contractor

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

9. The tenderer's particular attention is drawn to the sections and clauses in the General conditions to the contractor 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 specification clauses which govern the rates which he is tendering.

10. A schedule of quantity 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 alternation by omissions, deductions or additions at the discretion of the Chief Engineer, Technical Education Circle, Chennai 600 025 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 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, overwriting or conversion of figures corrections where unavoidable should be made by crossing out, initialing, dating and rewriting.

11. Tenderer offering a percentage deduction from or increase on the estimate amount 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 alterations which is made by the tenderer in the contract form the conditions of contract, the drawings, specifications or quantities accompanying the same will be recognized and, if any such alternations are made the tender will be avoid.

12. The tenderer should workout his own rates, without reference being made to Public Works Department current schedule rates or the Public Works Department estimates 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 price for finished work accordingly. Not with standing any subsequent charge 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.

14. The attention of the tenderer is directed to the contract requirements as to the time of beginning work, the rates of progress and the dates for the completion of the whole work and its several parts. The rate of progress and of proportionate value of work done from time to time as will be indicated by the Executive Engineers certificates of the value of

the 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 contractor.

NAME OF WORK: **Construction of Building for Government Arts and Science College at Srivilliputhur in Virudhunagar District.**

Period after date of commencement	Percentage of work completed (Based on the contract lump sum amount)
First Three months	15%
Second Three months	35%
Third Three months	65%
Fourth Three months	100 %
TOTAL **TWELVE** MONTHS ONLY	100%

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

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

17. The Chief Engineer or other sanctioning authority reserves the right to reject any tender all the tenders.

18. The tenderers who are themselves not professional qualified shall under take to employ qualified 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 works etc.

Contractor

THE SCHEDULE

	Value of contract		Minimum qualification and no. of technical persons to be employed.
1.	Above Rs.1,00,000/- and up to Rs.5.00 lakhs	1. 2.	One diploma holder in Civil Engineering (Or) Not less than one retired junior engineer.
2.	Above Rs.5.00 lakhs and up to Rs.10.00 lakhs	1. 2. 3.	One B.E., (Civil) (or) Equivalent Degree holder (or) Not less than one retired sub Divisional officers AEE/ADE (or) One Diploma holder with three years experience.
3.	Above Rs.10.00 lakhs and up to Rs.25.00 lakhs	1. 2. 3. 4.	One B.E., (Civil) with 3 years experience plus one Diploma holder in Civil Engineering. (or) Equivalent Degree holder with 3 years experience plus one Diploma holder in Civil Engineering. (or) Not less than one retired Sub-Divisional officer plus one diploma holder in Civil Engineering. (or) Two Diploma Holder in Civil Engineering with 3 years and 5 years experience respectively.
4.	**Above Rs.25.00 lakhs and up to Rs.50.00 lakhs**	1. 2. 3. 4.	One B.E., (Civil) with 3 years experience plus two Diploma holder in Civil Engineering. (or) One B.E., (Civil) with 3 years experience plus two retired junior Engineering. (or) Equivalent Degree holder with 3 years experience plus two Diploma holders in Civil Engineering / two retired junior engineers. (or) One retired Sub Divisional Officer (AEE or ADE) plus two Diploma Holders in Civil Engineering. (or) One retired Sub Divisional Officer (AEE or ADE) plus two retired Junior Engineers.
5.	**Above Rs. 50.00 lakhs**	**1** **2** **3**	**One B.E. (Civil) or equivalent degree holder with three years experience or not less than one retired Assistant Executive Engineer.** **AND** **One B.E. (Civil) or equivalent degree holder** **AND** **One more diploma holder in Civil** **OR** **One retired Junior Engineer**

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.

Contractor

2. A penalty of Rs.2000/- per month, for diploma holder and Rs.5000/- 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 value of contract. Engineers with Mechanical Engineer qualification and retired from Civil Engineer Departments are also suitable to supervise the Civil Engineering works because of their experience in Civil Engineer field.

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

5. It will not be incumbent on the part of the contractors to employ Technical Assistant / Assistants when the work is kept in abeyance due to valid reasons and if during such period in the opinion of the Executive Engineer the employment of Technical Assistant / Assistants is not required for the due fulfillment of the contract.

19. A tenderer submitting a tender which the tender accepting authority considers excessive and or indicative of 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 if any, fixed by the Government or the reasonable price permissible for the tenderer to charge a private purchase under the provisions of Clause 8 of Hoarding and the Profiteering Prevention Ordinance 1943 as amended from time to time and on similar principles in regard to labour and supervision in the construction.

20. The contractor shall comply with the provisions of the Apprentices Act 1961 and the rules and orders issued there under from time to time. If he falls 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 breach of contract provided in the conditions of contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the Act. The contractor shall during the currency of the contract ensure engagement of the apprentices in the categories mentioned below who may be assigned to him by the Director of Employment and Training/State apprenticeship Advisor, Tamilnadu, The Contractor shall train them as required under the apprentices Act 1961, and the rules made there under and shall be responsible for, all obligations of the employer under the said act including the eligibility to make payments to the apprentice as required under the said Act.

Contractor

Value of contract	Category	No. to be appointed
Rs. 1 lakh and up to Rs. 3 Lakhs	❖ Building constructor ❖ Brick layer	1 1
Above Rs. 3 Lakhs and up to Rs. 10 lakhs	❖ Building constructor ❖ Brick layer Diploma holder in civil Engineering	1 1 1
Above Rs. 10 Lakhs and up to Rs. 50 lakhs	1. Building constructor 2. Brick layer 3. B.E., (Civil) or Equivalent Degree holder	1 1 1

Unless the contractor has been exempted from engagement of apprentices by the director of employment and training / State Apprenticeship Advisor 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.

21. The contractor should employ one I.T.I. trained mason for every ten masons of part thereof in case of non – availability of ITI trained masons, the contractor should obtain the prior approval of the Executive Engineer concerned, before proceeding with the contract with other kind of masons.

22. The fact of submitting the tender implies that the tenderers have actually inspected the site of work and have examined before tendering the nature and extent of various kinds of soils at various depths and have based their tender in such examinations by them and no future representation in this regard will be considered.

23. (i) . The contractor shall be solely responsible for the payments of Sales Tax under the provisions of the Madras Central Sales Rules Tax Act 1939 (Madras Act II of 1939) as in force for various items of work . Time being and the rates for the various items of work shall remain unaffected by the changes that may be made from to time to time in the rate at which such tax is payable. Sales tax and the materials supplied to the contractor as amended from time to time shall be paid by them separately and the relevant chalans produced to the departmental officers.

Contractor

(ii) The Contractor shall pay Sales Tax as per net provision under 7F for deduction of Tax at source introduced in Tamilnadu General Sales Tax Act 1959 by Tamilnadu Act 15 of 1999. Accordingly 2% in respect of civil work to be deducted . The procedure being followed for deduction of Income tax at source may be followed in respect of Sales Tax on works contract also.

The Chief Engineer, reserves to himself the right of allotting the different sub-works to the different contractors or to one and the same contractor as the may decide after the receipt of tender.

24. Additional security to be furnished for the lesser rates

25. On evaluation of tender, if it is found that if the overall quoted amount of the tender is less than 5 to 15% of the value put to tender, the contractor shall pay an additional security at 2% of the estimated value. If the tender discount exceeds 15% to 20% the contractor shall pay an additional security deposit of 50% of the difference between the quoted amount and estimate amount. Failure to furnish the additional security deposit within 15days from the date of receipt of acceptance order and execute the agreement shall entail cancellation of award contractor and forfeiture of EMD furnished.

26. In case of contractor for construction of buildings either permanent of semi-permanent buildings, a sum of equivalent to 2½ % of the value work done will be retained from the Government for a period of one year reckoned from the date of completion of the work in order to enable to departmental officers to watch the effect of all seasons on the work done by the contractor. The amount so far retained with the Government will be returned only on the expiry of one year period referred to above and on execution of indemnity bonds by the contractor for a further period of four years. The contractor shall be liable to set right all defects arising our his faulty execution or sub-standard work noticed during the above five years period at his cost.

27. The contractor is bound by all the conditions of the clauses of the general conditions of contract amended from time to time.

28. In the event of work if transferred to any other Circle / Division/ Sub-Division and Chief Engineer/ Executive Engineer/ Assistant Executive Engineer who is in-charge of the circle / Division / Sub-Division having jurisdiction over the work shall be competent to exercise all the powers and privileges reserved in favour of the Government.

Contractor

APPENDIX II (a) TENDER

To

His Excellency the Governor of Tamil Nadu,
represented by the Chief Engineer of
Technical Education Circle, Chennai 600 025.

Sir,

I/We do hereby tender and, if this tender be accepted, undertake to execute the following work viz…….. as shown in the drawings and described in the specification deposited in the office of the Chief Engineer of Technical Education Circle, with such variation by way of alternations or 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 sums as may be arrived at under the clause of the General condition 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 item Schedule "A" annexed (in words and figures) for which I/We agree to / execute the works and receive payment on measured quantities as per the general conditions of the contract.

3. I/We do hereby distinctly and expressly declare and acknowledge that, before the submission of my or our …… tender. I / We carefully following 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 examinations 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 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 recruitment, covenants stipulations and restrictions contained in the contract and in the said plans and specifications; and distinctly agree that I/We will not here after make any claim or demand upon the Government, based upon or arising out of any alleged misunderstandings or misconception or mistake on …….. part the said requirements, covenants, 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 during the current year in respect of …….. (here particulars of the previous occasion on which the certificate was produced should be given). The legal address of the contractor for service of all letters of notices will be as follows ……

5 (i). (a) I / We enclose herewith details of payment of sum of Rupees …….. as Earnest money not to bear interest.

Contractor

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 deposit, I / We ..... Have enclosed a ..... Bearing No. .... date ..... issued by ..... for a value of drawn / endorsed pledged in favour of the **Executive Engineer, PWD, Technical Education Division, Madurai.**

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

6. If my / our tender is not accepted, this um shall be returned to me / us on my / our application when intimation is sent to me / our of rejection or at the expiration of three months from date of this tender, whichever is earlier, if my/our tender is accepted, the earnest money deposit shall be retained by the Government as security for the due fulfillment of the contract. If upon intimations being given to me / us by the authority authorized by the Government under the Article 299(i) of the constitution (here in after called the accepting authority) of acceptance of tender. (I/W) fail (/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 (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. 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 Tamil Nadu and the tender documents, (i.e) tender notice tender with schedules, General condition to the contract and special condition of the tender, negotiation letter, communication of acceptance tender shall constitute the contract for this purpose and be the foundation of rights both the parties, as defined in, clause (iv) of tender notice, provided that, it shall be open to the accepting authority to insists on execution any written agreement by the tenderer, If administratively considered necessary or expedient.

8. I / We have also signed the copy of Tamil nadu 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 be contract and all specifications for items of works described by a specification number in Schedule “A”.

9. In consideration of the payment of Rupees ..... or such other sum as may be arrived at under the clause of the General condition to the contract, relating to payment on lump sum basis or by final measurements at unit prices, I/We agree subject to said condition to execute and complete the works shown upon the said drawing serially number from 1 to ..... Inclusive ..... (Schedule B) and described in the specifications (Schedule C) and to the 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 thereof as are provided for in the said conditions.

Contractor

10. The term “Chief Engineer” in the said conditions shall mean the Public Works officer in charge of the Circle having jurisdiction for the time being over the work competent to exercise all the powers and privileges reserved herein in favour of Government with 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 (i) 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 Tamilnadu Public Works Department Code and the site (on premises) is handed over to me / us as provided for in the said conditions and agreed to complete the work within 12 (Twelve) months from the date of such handing over of the site (or premises) and show progress as defined in the tabular statement “Rate of Progress” subject nevertheless to the provision for extension of time contained in clause 56 of the General conditions to the contract appended to the Tamil Nadu Building Practice.

12. I/We agree that upon the terms and conditions of this contract being fulfilled and preformed to the satisfaction of the Chief Engineer, the security deposited by me / us herein before recited of such portion thereof as I/We may be entitled to under the said conditions be paid back to me/us as provided in clause 64 of the General condition 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 undertake 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 employed	Qualification and Experience
1.		
2.		
3.		

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

i). In case any dispute or difference between the parties to the contract either during the progress or after the completion of the works or after determination, abandonment or breach of the contract or as to any other matter or thing arising there under except as to the matters left to the sole discretion of the Executive Engineers under clause 18, 20, 25-3, 27-1, 34, 35 and 37 of the general condition of the contractor as to the with holding by the Executive Engineers or the payment of any bill to which the contractor may claim to be entities. Then either party shall forth with give to the other, notice of such dispute or difference and such dispute or difference shall be and is hereby referred to the arbitration of the Superintending Engineer, PWD., Buildings Construction and Maintenance Circle, **Madurai** Mentioned in the “Articles of agreement” (here in after called the arbitrator) in case where the value of claim is less than and upto Rs.50,000/- (Rupees fifty thousand only)

Contractor

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

Signature of the contractor
With Date

15. In pursuance of negotiation with the Chief Engineer of Technical Education Circle 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

Signature of Contractor

Date :

16. On behalf of the Governor of Tamil Nadu and as duly authorised by the Governor under Article 299 (1) of the constitution the above tender for a value of Rs……. (Rupees ……) is accepted on this day …….. of …….. 200 .

Signature of the Witness in full and Address with Name in block letter

Signature and Designation

Contractor

ANNEXURE TO TENDER NOTICE

SCHEDULE "A"

Schedule of rates and Approximate quantities.

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

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

Item No	Probable quantity * *Figures	Description of work	T.N.B.P. No.
(1)	(2)	(3)	(4)

Vide Separate sheet enclosed

Rate		Unit words	Amount
Words	Figure		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 meter, Kg. etc.

Contractor

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

SUPPLEMENTARY LIST

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

Serial Number	Drawing Number	Description	Date on which the Drawing was supplied
(1)	(2)	(3)	(4)

Contractor

SCHEDULE C

List of specification for the various item of work supplementing those prescribed in Schedule "A" by standard specification Number.

1. The contractor shall be employ the following technical staff for supervising the work and shall see that one of the is always at site, during working hours personally checking all items of work and paying extra attention to such works as may demand special attention (eg.) reinforced concrete work etc.

Name or Member of the technical staff to be employed	Qualification	Experience

Note 1 : In the case, the contractor is himself professionally qualified is not in position to remain always at the site for the work during working hours, personally checking all items of work and paying extra attention to such works as may demand special attention (i.e..) RCC work, etc, the contractor should employ technically qualified men and as prescribed for the work.

Note 2 : A penalty of Rs.2000/- (Rupees two thousand only) per month for diploma holder and Rs.5000/- (Rupees five thousand only) per month for degree holder will be levied in case of default of the part of contractor as per the norms specified regarding appointment of Technical Assistant with tender notice

Contractor

IMPORTANT CONDITIONS

1. If rate for 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. 4,99,000/- (Rupees Four lakhs ninety nine thousand 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 Indira Vikas 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 passbook or Post office time deposit or Indira Vikas Patras before conclusion of Agreement. The EMD as indicated above shall be drawn favour of the Executive Engineer, Technical Education Division, **Madurai.** 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 28/64) and that the contractor is responsible to file the Sales Tax return and pay the tax amount as demanded by the Commercial Tax Department No. request for payment of sales tax separately in addition to tendered rates due to any plea of subsequently 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 of reinforcement will be found out by the actual average weight of the sections used for the purpose, the out but 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 Assistant Executive Engineer in charge of the work payment for fabrication of reinforcement grills will be based on that section weight ascertained and recorded in the M. books.

Sub-Clause 26 (1) (A) : 26.a (A) : The shrinkage 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 of permanent to on suro structural stability of the buildings.

Sub-Clause 64 (1) (A) : 64, 1 (A) Not withstanding the above clause, the withheld amount of 2 ½% from the final bill in respect of contract for construction of original building will be retained by the Government for a total period of one year in lieu of six months period referred to in clause 64 (1) and will be released after the expiry of one year period on execution of an indemnity bond by the contractor to the satisfaction of the Executive Engineer for further period of four years to ensure structure stability of the building under clause 26 (1) (A).

Contractor

6. Validity

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

7. Water supply

Only clean fresh water shall be used on 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, meter 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

CEMENT AND STEEL SUPPLY BY CONTRACTOR (SPECIAL CONDITION)

1. The Contractors shall procure and use Cement and steel required for this work.

2. Cement to be used in the work shall conform to IS 269 only

3. Mild Steel and cold twisted deformed bats to be used on the work shall conform to IS 1139. Steel Rerolled from Scrap will not be permitted on any account.

4. Cement and steel to be used on the work shall be got approved by the Executive Engineer before use on the work. Necessary test certificate has to be produced at the time of supply.

5. Before procuring cement and steel from the market the contractors should test the same in Government Testing Laboratories Contractors at their own cost should got the materials tested in the Government approved Laboratories and should produce the test certificate to the field engineers. The samples should be checked at P.W.D. Laboratories at various stages whether the materials supplied by the contractor, are standard ones or it should be got tested in Government approved Laboratories.

Contractor

SALES TAX REGISTRATION &
DEDUCTION OF SALES TAX FROM BILLS

The tenders could be required to indicate their registration number under the Tamilnadu General Sales tax Act 1959 in the tender form and produce sales tax clearance certificate issued by the Commercial Tax department before final settlement of bills.

According to the notification issued by the Commissioner of sales tax Chennai with regard to "Deduction of Sales tax at source in respect of works contractor in the TAMILNADU GOVERNMENT GAZETTE CHENNAI, dated 31.05.1999, a new provision under 7F for deduction of tax at sources is introduced in the Tamilnadu General Sales tax Act 1959 by Tamilnadu Act 15 of 1999 with effect from 10.06.99. as per this new section, 7F of this act at the time of payment of such sum deduction @ 2% (Two percent) in respect of civil works and 4$ (Four percent) in respect of all other works contractor from the total amount payable to the contractors and the amount so deducted shall be deposited to the Assessing officer concerned with in "SEVEN" days.

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 contractor shall make his own arrangements for water and shall meet all charges therefore. The special attention of the Contractor is drawn to clause 39 of preliminary specification of the T.N.B.P. regarding water and lighting.

3. The broken stone for concrete and RCC work shall be granite and passed by the Executive Engineer.

4. All iron work or steel work of every kind such as to be embedded in concrete shall immediately on arrival at the site be properly scrapped and wire brushed and given priming coat of approved lead painting without claims for extra.

5. The iron holdfasts shall be buildup on the walls in cement mortar 1:3 at the time of construction of walls. No extra claim shall be due for the same wherever the holdfasts are to be provided to 9" thick wall. Those should be fixed with cement concrete 1:3:6 using 20mm gauge broken granite stone jelly for proper anchorage and proper biding. No separate for such pockets of concrete filling at 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 work. Country wood where specified shall be "Karimarudhu" or "Kongu" for scantling "Aiyini" for planks.

7. Holes for Electric, wiring, water supply and drainage's etc. shall be provided as directed during progress of work without any claim for extra.

Contractor

8. The work will be carried out with the lest hindrance to the adjoining building and the contractor will be responsible for the damages caused to the existing fixtures, electric fittings etc. the course of execution and the contract shall make good nay damages without any claim for extra.

9. In the case of "T" beams and "L" beams the quantity given in the schedules is the quantity for rib portion only. The top flange portion will be always measured with the general slab portion and paid for a the slab rate only. For all RCC works, the rate shall be include the treatment of bearing as per TAMILNADU BUILDING PRACTICE.

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 windows 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 difference floors, the contractor should not that one rate is applicable for all floors indicated in the detailed plans. Any claims for extra for such items floor war will not be entertained under any circumstances.

13. The project if any to the masonry will be measured under the relevant items and non extra will be paid for finishing the same.

14. (i). the work in Public Works Department (Buildings) executed by the contractor under the contract shall be maintained by the contractor until the work is taken over by the Executive Engineer. The contractor shall accordingly arrange his own insurance against fire, flood, volcanic eruption, earth quake other convention of nature and all other natural calamities risk arising out of acts of God during such period and that the Government shall not be liable for any loss or damages occasioned by or arising out of any such acts of God.

14.(ii). Provided, however that the contract shall not be liable for all or any loss or damages occasioned by or arising out of act of foreign enemies, invasion hostilities or war like operation (before or after declaration of war) rebellion, military or Usurped power.

RETENTION OF WITHHELD AMOUNT

14.(iii). 21/2% of the total value of the work will be retained in the final bill of the work for the period one year reckoned from the date of completion of the work in the order to enable the department to watch the effect of all seasons of the work. The contractor should furnish an indemnity bond for further period of four year. If any defects are notified in the above said period the defects should be rectified by the contractor at his own costs as directed by the Departmental Officers and no extra payment be made for the rectification of such work.

Contractor

REVENUE RECOVERY ACT

14.(iv). Whenever any amount has to be paid by the contractor in lieu of determination of the contract by virtue of clause 57 (4) any amount that may be due or may be come due from the contractor under the presence and the contractor is not responding to the demands for the payment of said amount, then the Government shall be entitled to recover the said amount under the provision of the Revenue Recovery Act.

In the event of the work being transferred to any other Circle / Division / Sub Division / Superintending Engineer / Executive Engineer / Assistant Executive Engineer who is in charge of Circle / Division / Sub Division having jurisdiction over the work shall be component to exercise all the powers and privileges reserved in favour of Government.

RISK INSURANCE

14 (v). The work executed by the contractor or under this contract shall be maintained by the contractor's risk until the work is taken over by the Executive Engineer. The Government should not be liable to pay for any loss or damages occasioned by (or) arising out of fire, flood, volcanic eruptions, earth quake, other conclusion of nature and all other natural calamities, risk arising cut of act of God during such period and that the option whether to take insurance coverage (or) not to care such risks is left to the contractor.

The contractor shall not be liable for all or any loss of damages occasioned by or arising out of acts for foreign enemies, invasions, hostilities or war like operation (before or after declaration of war) rebellion military or usurped power.

ARBITRATION CLAUSE

14 (vi). In case any dispute or difference between the parties to the contract either during the progress or after the completion of the works or after determination, abandonment or breach of the contract or as to any other matter or thing arising there under except as to the matters left to the sole discretion of the Executive Engineers under clause 18, 20, 25-3, 27-1, 34, 35 and 37 of the general condition of the contractor as to the with holding by the Executive Engineers or the payment of any bill to which the contractor may claim to be entities. Then either party shall forth with give to the other, notice of such dispute or difference and such dispute or difference shall be and is hereby referred to the arbitration of the Superintending Engineer, PWD., Buildings Construction and Maintenance Circle, **Madurai** Mentioned in the "Articles of agreement" (here in after called the arbitrator) in case where the value of claim is less than and upto Rs.50,000/- (Rupees fifty thousand only)

In case where the value of the claim is more than Rs.50,000/- the parties will seek remedy through the competent civil court (G.O. Ms. No.253, PWD., dated 24.02.1981.

14 (vii). If at any subsequent to the execution of this agreement, Government materials other than those specified in the agreement are supplied to the contractor for use of the work, they will be charged at the market value prevailing at the time of writing of the charge and the should intimate in writing the rate which he demands for finish the work in view of the fact that he is to use Government materials. No centage of incidental charges will be borne by the Government in connection with the supply of the materials referred to in this paragraph.

ADDITIONAL SPECIFICATION

1. The arrangements 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 or TNDSS No.30. They must be made smooth and perfectly level at top so as to give smooth and even finish to the RC ceilings. Alternatively, the contractor may use steel sheet cover wooden forms provided the required finish to the underside of the slab is obtained. Mango plans shall not be used under any circumstances. Centering and form work shall be provided to the extent and area ordered by 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 area 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. M.S. and R.T. steel rods should be cut and placed as reinforcement with proper care according to the available rods at site so as to ensure the minimum possible wastage.
   (a) The cut bits will not be taken over by the department.

   (b) The maximum percentage of wastage permissible in any size of reinforcement rods shall be 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 theoretical requirements and shall be charged only at the issue rate.

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

4. For the quantity of cement used in excess 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.

5. <u>CONDITION ON ENGAGING CHILD LABOUR:</u>

   The Work contract assigned to the Contractor shall be cancelled if they engage child labour in executing works and such Contractors will be black listed for three years.

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 contractors 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

3. No royalty shall be charged where due for materials quarried from the Public Works Department or District Board or other Government Quarries. Necessary assistance will be given to the Contractor by the PWD 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 charge 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 road, 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 were issued to them by the department and charged to their accounts, are the property to the contractors and can however be taken 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 which the article or articles of a similar description can be procured at a given time at the store, godown, from Public market suitable to the Division for obtaining supply there of.

   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 element of storage charges if any.

   The surplus materials which were originally issued to the contractor by the department for use of 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 workmen.

8. If nigh 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 labours below the age of 12 years and shall also note that he must offer employment to ex-servicemen. Ex-toddy tappers and unemployment agriculture labourers as far as possible.

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

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

12. The contraction of the building will be deemed to be completed only if all the items of work including finishing items contemplated herein after executed.

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

14. Construction Materials

Supplemental to clause of 20 of General conditions.

Cement :

The contractor has to make his own arrangements for the procurement of Cement of required specifications for the works subject to the followings :-

(A). The contractor shall procure cement required for the works only from reputed cement factories (main produced of their authorised agents, manufacturing cement to ISI standard) acceptable to the Engineer-in-Charge. The contractor shall be required to furnish to the Engineer-in-Chief bills of payment and cost certificates issued by the manufactures or their authorised agents to authenticate procurement of quality cement from the approved cement factory. The contractor shall make his own arrangements for safe haulage and adequate storage of cement.

(B). The contractor shall procure in stand packing of 50Kg per bag from the authorized manufacturer. The contractor shall make necessary arrangement at his own cost to the satisfaction of Engineer-in-Charge for actual weightment of random sample from the available stock and shall confirm with the specification laid down by the Indian Standards Institutions or other standard foreign intuitions as the case may be. Cement shall be got tested for all the tests as directed by the Engineer-in-Charge atleast one month in advance before the use of cement bags brought and kept at site godown.

(C). The employer will furnish air recraing agents and admixtures required to the contractor free of cost at the employer stores. The use of such admixtures and agents shall be made as per the instructions of the Engineer-in-Charge. The cost of cartage / storage, handling, batching mixing shall be borne by the Contractor and shall be included by him to unit officers tendered for concrete

(D). The contractor should store the cement of 60 days requirement atleast one month in advance to ensure the quality of cement to brought to site and shall not remove the same without the written permission of Engineer – in – Charge.

The contractor shall forthwith remove from the works area, and the cement that the Engineer-in-Charge may disallow for use on account of failure to meet with required quality and standard.

(E). The contractor will have to construct sheds for storing cement having capacity not less than the cement required for 9 days use, at approved locations. The Engineer – in – Charge or the representative shall have free access to such store at all times.

(F) The contractor shall further at all times satisfy the Engineer-in-Charge on demand by production of records and test books or by submission of returns and other profs as directed that the cement is being used as tested and approved by the Engineer – in – Charge for the

purpose and the contractor shall at all times, keeps his record upto date and enable the Engineer-in-Charge to apply such checks as he may desire.

(G) Cement which has been unduly long in storage with the contractor or alternatively has deteriorated due to inadequate storage and thus become unfit for use on the works will be rejected by the Department and no claim will be entertained. The Contractor shall forth with remove from the work are any cement the Engineer – in – Charge may disallow for use of work and replace it by cement complying with the relevant Indian Standards

14.2. STEEL

The contractor shall provide mild steel (MS) reinforcement basis, High Yield strength deformed (HYSD) bars, rods and structural steel etc., required for the works only from the main and secondary producers manufacturing steel or other authorized agents to the prescribed specifications. Bureau of Indian Standards requirements and licensed to affixing ISI test certificate issued by the Government approval laboratory certification marks and acceptable to the Engineer – in – Charge. Necessary ISI test certification are to be produced to Engineer – in – Charge before use on works.

The Diameters and weight of steel should be as follows.

Sl. No.	**Diameter of Rod**	**Sectional weight in kg per running meter both for plain and HYSD Steel.**
1	6 Millimeters	-
2	8 Millimeters	-
3	10 Millimeters	-
4	12 Millimeters	0.89
5	14 Millimeters	0.21
6	16 Millimeters	1.58
7	18 Millimeters	2.09
8	20 Millimeters	2.47
9	22 Millimeters	2.98
10	25 Millimeters	3.85
11	28 Millimeters	4.83
12	25 Millimeters	6.35
13	20 Millimeters	4.03
14	32 Millimeters	6.31

15	33 Millimeters	6.71
16	36 Millimeters	7.99
17	40 Millimeters	8.06
18	42 Millimeters	10.88

Note: If any rods other than those specified above are used the weight shall be as per standard steel tables.

ADDITIONAL CONDITION - II

The contractor should use steel centering sheets over sites as to obtain the required finish to the under site of the slab centering steel sheets must be made smooth and perfectly level and to give smooth and even finish to the RCC ceiling centering and form work shall be provided to the and area ordered by the Executive Engineer during execution.

ADDITION CONDITION OF CONTRACT - III

The contractor shall at his own expenses provide arrangements for the provision of footwear for any labour during cement mixing work all other similar type of work involving the use of tar, mortar etc. to satisfaction of the Engineer-in-charge and no his failure to do so, the Government shall be entitled to provide same and recover the cost from the contract.

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

ADDITIONAL CONDITION OF CONTRACT - IV

Rules for the provision of Health and Sanitary arrangements 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 primary 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

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

DRINKING WATER

2. (a) Water of good quality fit for purposes shall be provided for the work people on a scale of not less than three gallons head per day.

(b). Where drinking water is obtained from an intermittent 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 meters 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 shall be entirely closed and be provided with a trap door, which shall be dust and waterproof.

(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 once in a month.

WASHING AND BATHING PLACES

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

LATRINES AND URINALS

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

i Where the number of persons employed does not exceeds 50 ..... 2 Seats

ii Where the number of persons employed exceeds 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 provide with water flushed latrine 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 during working hours and kept in a strictly sanitary condition. The Latrines 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 expense, in outside pits approved by the local public health authority. The contractor shall also employ adequate number of scavengers, conservancy staff to keep the latrines and urinals in a clean condition.

SHELTER 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.

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 not be constructed on a lower standard than the following.

i. Thatched roofs
ii. Mud floors and walls
iii. Planks spread over 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 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 expedient.

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 than the cheap shelter type to live in which the work pertaining to locality are accustomed to. A floor area of about 1.80 meter - 1.5 meter for 2 persons shall be provided. The sheds are to be in rows with 1.5 meters clear space between sheds and 24 meter clear space between row if conditions permit. The people's camp shall be laid out in units of 400 persons each. Each unit to have clear space of 14.4 meter around.

ADDITIONAL CONDITION – IV

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

PART – I

ARTICLES – 1

1. Suitable scaffolds shall be provided for workmen for all work that cannot be safely done from a ladder or by other means.

2. A scaffold shall not 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 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 be should taken step 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 sag unduly or unequally.

a) be so constructed and maintained to obviate from risks of persons tripping or slipping and

b) be kept free from any unnecessary obstruction.

c) every working platform gangway working place and staircase shall be suitable forced

ARTICLE – 3

1. Every opening in the building or in a working platform shall except for the time to the extent required to allow the excess of persons or the transport or shirting 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 exceeding that to be prescribed by national laws or regulations, suitable precautions shall be taken to prevent the fall of persons of 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 hand hold and foot held 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 materials on the site shall be so attached or placed as to cause danger to any persons.

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 patient defects and
   b. be kept in good hoisting or lowering materials or as a means of suspension shall be of suitable quality and adequate strength and free 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, swivel and pulley block used in hoisting or lowering materials or as a means of suspension shall be periodically examined.

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 law, regulations shall be in control of nay hoisting machinery including any scaffold which, or gives signals to the operator.

ARTICLE – 8

1. In the case of every hoisting machine and every chain ring hook, shackle swivel and pulley block used in hoisting or lowering or as a means of 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. Motor gearing, 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 well reduce the risk of the accident descent of the load.

3. Adequate precautions shall be taken to reduce the risk of any part of 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 drawing, all necessary equipment shall be provided and kept ready for use and all necessary step shall be taken for the prompt reduce of any person in danger.

ARTICLE – 12

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

ARTICLE – 13

Where large work place 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 shall be kept ready 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 tiles shall be subject to a pressure of not less than 140 Kg per sq.m. (or 2000 lbs per inch)

2. Proportion of cement to aggregate in backing of the tiles shall not be less than 1.5 by weight.

3. On removal from mould, the tiles 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 conformity, to the requirements of Transverse, strength, resistance to wear and tear absorption and would minimize shrinkage and cracking, tiles shall be stored under cover.

4. Tolerance: Tolerance on length and breath shall be plus or minus one millimeter. Tolerance on thickness shall be plus 5mm. But the range of dimensions any in one delivery of tiles shall not exceed 1mm of length and breadth and 3mm on thickness.

THICKNESS OF WEARING LAYERS

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

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

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

GENERAL QUALITY OF TILES

8. Unless otherwise required the wearing face of the terrace tiles shall be mechanically should and flat. The wearing face of the tiles should be plane from projection epressions and crack (Hair cracks not included) and shall be reasonably parallel to the backface of tiles. All angle shall be right angels and all edges shall be sharp and true.

9. Breaking Transverse strength of tile shall be given as below;

Size of tiles	Span	Breaking wettest	Load based Dry test
19.85 X 19.85cm	15cm	71 Kg	106 Kg
24.85 X 24.85cm	20cm	90 Kg	120 Kg
29.85 X 29.85cm	25cm	99 Kg	148 Kg

10. The average wear of not less than 12 specimens shall not exceed 2mm and wear on any individual specimen shall not exceed 2.5cm 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 absorption test.

12. The density of the tiles shall be in the order of about 2.4 gms. The tiles shall be laid with the minimum possible width of joint and not exceeding 1/32 inch. The joints shall be filled with gray 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 off to 11/2" radius with same quality of materials and colour of the tiles of the floor. But laid in situ and these cover 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 races in the brick wall itself so that the projections does not exceed ¾" from the face of the wall i.e. the finished plastered surfaces.

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

GUIDE LINES FOR ADOPTION OF STRENGTH GARDENING OF CONCRETE

Plain and reinforced concrete have been graded according to the cube compressive strength and designation as M100: M150, M200, M250, M300, M350 and M400. In the designation of concrete the letter "M" refers to the mix and the "Number" to the specified 28 days 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, 1:11/2:3 and 1:2 nominal mixed of ordinary concrete currently used, the National Building code gives necessary specification for strength gardening 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 materials to be actually used to obtain the

specified strength with the maximum quantity of cements. However, the maximum total quantity 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 test on the 15cm cubes, minimum cement content, required to be used and the approximate proportions approved fine and coarse aggregate 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 propose to use and get the materials approved. The mix with the actual approved materials to be used shall be got designed in an approved laboratory by the contractor with minimum quantity 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 so 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 work tests also show the required strengths.

If during the progress of work, the contractor wishes to change the materials, the proportion 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 adjustment 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 bag shall be added in quantity measured by volumes or by weight. Where weight of cement determined by accepting the maker weight per bag, a reasonable number of bag shall be weighted separately to check the net weight, and the cement is weighted weight per bag, a reasonable number of bags, shall be weighed on the site and not in bags. It shall be weighted separately from the aggregate. All the weighting equipments shall be maintained in a clean and serviceable condition and their accuracy checked periodically.

MIXING

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

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 designed and preliminary test should be carried out.

A Preliminary test is 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 concrete operation starts.
b). Determining the adjustments required in the designed mix when there is a change in the materials used during the execution of works or.
c). Verifying the strength of cement mix.

(B). WORK TESTS

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

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 tests shall be taken in the presence of the Assistant Engineer concerned and the contractor or his authorized 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 Number
3. Date and time of sample taken
4. Sample Number
5. Number 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. Initial of Assistant Executive Engineer and contractor's authorised agent in whose presence the sample is taken.
10. Result of 7 days test.
11. Result of 28 days test.
12. Review and remarks by Executive Engineer.

EXTRACT OF :

NATIONAL BUILDINGS 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 as designated as M100, M150, M200, M250, M300, M350 and M400.

Note ; In the designated of a concrete mix, letter "M" refers to the mix and the number of specified 28 days work cube compressive strength of that mix expressed in Kg/sq.m.

4.2.2.1. Where ordinary portland cement or Portland blast furnace slag cement conforming to accepted standard VI-5 (2)* is used. The compressive strength requirements for various grades of concrete shall be as given in Table.1. Where rapid hardening Portland cement is used, the 28 days compressive strength requirements specified in Table.1. 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 law heat Portland cement.

IS-455/1967 - Specification for Portland and blast furnace slag cement.

4.2.2.2. The strength requirements specified in Table.1. shall apply to both controlled concrete and ordinary concrete (see 4.31) 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 days compressive strength test in all cases, the 28 days compressive strength specified in Table.1. shall alone be the criterion for acceptance or refection of the concrete. If however form 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 days comprehensive strength and the modulus of rupture at 72 + 2 hours or at 7 days of compressive strength at 7 days may be accepted. The Engineer-in-Charge may suitably relax the frequency of 28 days 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 with ordinary cement.

(b). Whether the strength of a concrete mix, as indicated by test lies between the strengths for any two grades specified in Table.1. such concrete shall be classified for all purpose as a concrete belonging to the lower of the two grade between which its strength lies.

4.3. PROPORTIONING AND WORKS CONTROL :

4.3.1. Methods of proportioning : The determination of the proportion of cement aggregate and water to attain the required strength shall be made by one of the following.

(a). With preliminary test by designing the concrete mix. Such concrete shall be called “Controlled Concrete”.

(b). With 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 grade M100, M150, M200, M250, M300, M350 and M400.

4.3.2.2. The concrete mix shall be designated to have an average strength corresponding to the value specified for preliminary test in table.1. The proportions chosen should be given such that the concrete is of adequate workability for the conditions prevailing on the work in question, and may 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 proper graded Aggregate of Uniform quality may be maintained over the period of work, the grading of aggregate should be controlled by obtaining the course aggregate, in different sizes and blending them in the right proportion when required 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 samples use in the preliminary tests.

4.3.2.4. In proportioning concrete, the quantity of both cement and aggregate should be determined by weight. Where the weight of cement is determined by accepting the manufactures weight per bag and reasonable number of bags should be weighed separately to check the net weight. Where the cement is weight on the site and not in bags it should be weighed separately from the aggregates. Water should be either-measured by volumes in calibrated tanks on weighed. All measuring conditions, and their accuracy may be periodically checked.

4.3.2.5. It is most important to maintain the water-cement 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 variations 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 the weight of aggregates due to variation in their moisture content suitable adjustment in the weight of aggregate should also be made.

4.3.2.6. No substitution in materials used on the work or alternation 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. To slump test or where facilities, exist the compacting factor test conducted in accordance with good practice (VI-5 (10) may adopted for this purpose.

4.3.2.8. A competent persons should be employed where first duty will be to supervise all stage in the preparation and placing of the concrete. All work test specimen should be made and site tests carried our 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 preferably be determined by weight. In late case, the weight should be determined from the volume specified in table.3. and the weight per litre of dry aggregate.

If fine aggregate, is moist and volume batching is adopted, allowances shall be made for bulking in accordance with good practice [VI-5 (9)]*

4.3.3.3. The water cement ration shall not be more than those specified in table.

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

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

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

4.3.3.4. Workability of 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 may be conducted in accordance with good practice [VI-5 (10)].

4.3.3.5. Allowance should be made for surface water present in the aggregate when computing the water cement. Surfaces 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 the 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 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 tests 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 a conforming to the specified grade shall being accordance with table.5. for both ordinary concrete and controlled concrete. No preliminary tests are, however, necessary in the case of ordinary concrete.

* ISI 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 aggregation for concrete.

* IS 516 – 1959 – Method of tests for strength of concrete.

TABLE. 1

STRENGTH REQUIREMENTS OF CONCRETE

(CLAUSE 4.2.2.1 AND 4.2.2.2.)

(All values in Kg / Cm^2)

Compressive strength of 15cm cubes at 28 days after mixing concrete in accordance with good practice (VI-5-(4)). *

Grade of concrete (1)	Preliminary tests min. (2)	Work test Min (3)
M100	135	100
M150	200	150
M200	260	200
M250	320	250
M300	380	300
M350	440	350
M400	500	400

Note 1 : Preliminary Test : A test conducted in a laboratory on the trail 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 adjustment 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 : Work 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 10cm cubes may be used in place of 15cm cubes provide the maximum nominal size of aggregate does not exceed 20mm. 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 than 40mm size is required to be tested, the size of cubes should be specified by the 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 10 cm 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 cubes, on in the absence of such comparative tests, by 10 percent of the value determined from the tests, in order to given the equivalent strength for 15cm cubes, when cubes larger that 15cm are adopted generally no modifications 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 and 30cm high cylinder in accordance with good practice (VI-5 (4))* instead of one cube, where cylinder strength figure given above shall be modified according to the formula. Minimum cylinder compressive strength required 0.8. compressive strength specified for 15cm cubes.

*THE CENTRAL ROAD RESEARCH INSTITUTE, New Delhi has carried out test with a view to establishing a relation between water cement ratio and the compressive strength of concrete using ordinary Portland cement manufactured in the country to conforming 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 days compressive strength of concrete tested in accordance with good practice (VI–5(2))**. These graphs have been given in Appendix–A. As they would be some assistant in obtaining the water cement ratio for trail mix of concrete.

TABLE.2.

OPTIONAL WORKS TEST REQUIREMENTS OF CONCRETE
(Clause 4.2.2.2 (a))
(All values in Kg/cm^2)

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

Grade of Concrete (1)	Compressive strength of 15cm cubes min 7 days (2)	Modules of Rupture beams test	
		At 7.2 + 2 Hours (3)	At 7.2 + 2 Hours (4)
M100	70	12	17
M150	100	15	21
M200	135	17	24
M250	170	19	27
M300	200	221	30
M350	235	23	32
M400	270	25	34

Note : Notes 3 to 5 under Table.1. are also applicable to this table.

* L.S. 516-1959 Methods of test for strength of concrete
* L.S. 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	Total quantity of dry aggregates by volume per 50 Kg of cement to be taken as the sum of the individual volumes of fine and coarse aggregate max	Proportion of fine aggregate to coarse aggregate	Quantity of water per 50 Kgs. Of cement Max
(1)	(2)	(3)	(4)
M100	300 Liters.	Liters Generally 1:2 for fine Aggregate to course aggregate	34 Liters.
M150	200 Liters.	By volume but subject to an Upperlimit 1:11/2 lower limit of 1:3*	32 Liters
M200	160 Liters.	--	30 Liters
M250	100 Liters.	--	27 Liters

Note : It may be noted for general guidance that M100, M150, M200 and M250 or ordinary concrete correspond approximately to 1:3:6, 1:2:4, 1:11/2:3 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 aggregate becomes finer 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 1:11/2, 1:2 and 1:3 for maximum size of aggregate 10mm, 20mm and 40mm respectively.

TABLE.4.

SURFACE WATER CARRIED BY AVERAGE AGGREGATE

Aggregate (1)	Approximate Quantity of surface water 1/m3 (2)
Very wet sand	120
Moderate wet sand	80
Moist sand	40
Moist gravel or crushed work	20 to 40

* Course aggregate, less the water it will carry.

* I.S. 383–1963 – Specification for coarse and fine aggregate for natural sources for concrete.

* I.S. 516–1959 – Specification for natural and manufactured aggregates for use in mass concrete.

TABLE.5.

ACCEPTANCE CRITERIA FOR CONCRETE (ALL GRADES)

Preliminary Test				Work test						
Minimum No. of specimens from each batch (cubes)		Minimum frequency	Criteria for acceptance	Minimum No. of specimens taken from the same day's Works				Minimum frequency		Criteria of acceptance
				(Cubes)		(Beam				
7 days compressive strength test as on optional test if desired	28 days compressive strength test			7 days compressive strength test as on optional test if desired	28 days compressive strength test	72 + 2 hours test as on optional test, if desired	7 day test as an optional test, if desired	In terms of the quantity of concrete	In terms of period	
(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 Tabl1. (For optional tests, see Table.2.) subject to the condition that only one out of five consecutive tests may give a value less than specified strength	3	3	3	3	For every 150 cubic meter of concrete of part there of	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 alteast once in 7 days of concreting	Accept of average strength of the specimens tested is not less than the strength specified in table1. (for optional tests see table.2.) subject to the condition that only one out of 3 consecutive tests may give a value less than the specified strength but this shall not be less than 90% of specified strength

--	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 Table1. subject to the condition that the average compressive strength shall be more than the specified compressive strength in Table.1. by at least the value of Standard deviation* of the series of test.	**5**	**5**	**5**	**5**	For every 150 cubic meter of concrete of part there of	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 alteast once in 7 days of concreting	Accept of average strength of the specimens tested is not less than the strength specified in table1. (for optional tests see table.2.) subject to the condition that only one out of 5 consecutive tests may give a value less than the specified strength.

* Standard Deviations = $\sqrt{\mathbf{M}\ \frac{d^2}{n-1}}$

Where d = individual deviation form 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.

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.

2. The rates shall include the dismantling, making holes in walls or slabs, and restoring the structure to the original conditions after the completion of the work.

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

4. The rate for laying stone were 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 damages to read and other structure.

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 taps where they are buried 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, fitting should not be spaced more than 150mm apart. The wooden plugs for pipe and bracket fitting should be properly fixed in C.M. 1:3 in holes make in masonry with the wide and wedge shaped plugs inside and hammered with them and into walls. The size of plugs should not be less than “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 meters at the lowest end.

8. Where a new seer 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 those.

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 flushing tanks, brackets, clamps used for fixing pipes and all lead connection.

   (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 resorting the structure to the original condition after the completion of the work.

SUPPLYING AND FIXING INDIAN TYPE WATER CLOSETS

11. The Indian type Water Closet shall be with “P” or “S” trap and glazed earthen 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 completion 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 test level wherever necessary with brick jelly concrete in lime mortar 1:2.

SUPPLYING AND FIXING EUROPEAN TYPE WATER CLOSETS

13. The water closet shall be glazed earthen were with “P” or “S” trap including PVC seat and cover and chromium plated fittings 15 litres Indian make glazed earthen water flushing tank supported on C.I. Brackets with necessary handle for pull float bell valve 12mm G.I. telescopic flush pipe connections to the closets including necessary wiped solder joints completed.

14. The fixing of water closet shall include the dismantling of existing floor wherever indicated making holes in necessary 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.