

ANNEXURE
PARTICULARS TO BE FURNISHED BY TENDERERS

1. Name of Tenderer :
2. Name of work : Construction of Veterinary Dispensary Building at Kelamangalam in Krishnagiri District.
3. Date of Tender : 28.04.2022
4. Total value of Tender : Rs. 48,35,000/-
5. Details about E.M.D. Enclosed for the tender and its validity :
6. Registered class of the tenderer with monetary limit and department in which registered (certified copy of the Registration should be attached. }
7. Recent works executed (Details about name place of work, value of the works, etc., should be furnished. }
8. Command of labour in brief :
9. Turn over of previous year (particulars for a period of three consecutive years to be furnished) }
10. Whether Income Tax clearance certificate is enclosed ; if not when it will be produced. }
11. Whether Sales Tax clearance certificate is enclosed. If not when will it be enclosed? }
12. Technical Assistant Details :

Contractor

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Buildings (C&M) Division, KRISHNAGIRI.1.

1. Name :
Qualification certificate :
Experience :

2. Name :
Qualification certificate :
Experience :

(OR)

3. Name :
If retired Civil Engineer Designation
and date of retirement.
(Copy enclosed)

4. If any other particulars :

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SPECIAL INSTRUCTIONS TO THE TENDERERS

Part – I

1. The tenderer should fill up the Annexure to the Tender schedule furnishing there to the required information.
2. The tenderers should furnish the particulars of name, address and technical qualification of the Technical Assistant proposed to be employed by them to look after the execution of this work as per terms and conditions of the contract.
3. All pages of the tender should be signed by the tenderer and corrections in rates should be duly attested by them.
4. A copy of the tenderers registration in P.W.D., as a contractor shall be attached with the tender.
5. Current Income Tax clearance Certificate shall be enclosed with the tender.
6. The following particulars shall also be furnished by the contractor along with the tenders.
 - a. A list of details of works execution by the contractors with their value.
 - b. A list of details of works under execution by the contract with their values.
 - c. Annual turn over of the contractor for the last one year. Necessary certificate to the effect issued by the respective Bank shall be attached.

Part-II

1. The tenders should carefully go through the tender schedule and quoted their rates for all times.
2. The rates should be filled in neatly in figures and in words and taking into account the metric units specified in the tender, scribing, over writings 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 rates quoted and the quantity of work to be done under the item.
4. The total for each page should be arrived at and carried over to every page and the grand total value of work should be worked out and shown at the end.

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5. The tender should be submitted along with the covering letter giving full details as called for in the tender notice and with particulars of following items.
- a. Whether they are registered contractors if registered together with the copy or letter registering them in the appropriate class.

- b. Details of the earned Money Deposit remitted such as small savings scripts, D.D., in which the earnest Money Deposit was paid.

In case the tenderers are eligible for concessional Earnest Money Deposit and accordingly they have tendered their No. and details from which the concession was granted to them to be specified and if possible a copy of this aforesaid reference may be enclosed along with the tender for ready reference.

- c. Details of previous work done by the tenderers covering the cost of work the agreement No 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 for reference to their record of every year details should be furnished so as to see that the tenderers have minimum experience of major buildings.
- d. List of various machinery and other equipments at the tenderer disposal for use in the execution of the work.
- e. The tender form should be filled in while submitted the tender. The tenders submitted without filling up the tender form is liable to be rejected.
- f. The certificates showing the annual turn over of the Contractor for the last one year issued by the respective bank shall be attached.

6. The tenders must be submitted in a foolscaps cover there by duly signing all the conditions. Plans and schedule issued and tender documents.

7. If at any time the Executive Engineer shall be of the opinion that the contractor is delaying commencement of the work or violating any of the progress or work as defined by the tabular statement "Rate of progress" in the "Articles of Agreement", The Executive Engineer, shall so advise the contractor in writing and at the same time demand compliance. If the contractor neglects to comply with such demand within 7 days after the receipt of such notice it shall then or at any time. There after be lawful for the Executive Engineer to determine the contract which determination shall carry with the forfeiture of the Security Deposit and total of the amount withheld from the final bill together with value of such work as may have been executed and not paid for such proportion of such total sums as shall be assessed by the Executive Engineer.

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TENDER FORM

To

His Excellency the Governor of
Tamilnadu Represented by
Executive Engineer, P.W.D.,
Buildings (C&M) Division, KRISHNAGIRI.1.

Sir,

I/wedo hereby tender and if this tender
be accepted undertake to execute the following works viz.

As shown in the drawings and describing in the specifications deposited in the office of the
Superintending Engineer/Executive Engineer of

Circle / Division with such variations by way of alterations (or) additions to and omission from the
said works and method of payment are provided for in the "Conditions of contract for the sum of
Rupees(to be entered in words and figures.)

Or such other sum as may be arrived at under the clause of the General conditions to contract
relating to payment on lumpsum basis or by final measurements at unit prices".

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

3. I/We do hereby distinctly and expressly declare and acknowledge that before the
submission of my/our tender, I/We have carefully followed the instructions in the tender notice
and have read the Tamilnadu building practice and the general conditions to the contract there
in and the Tamilnadu building practice addenda contract volume; and that I/We have made such
examination of the contract documents and of the plans, specifications, quantities and of the
location, where the said work is to be done, and such investigation of the work required to be
done and regard to the materials required to be furnished as to enable me/us to thoroughly
understand the intention of the same and the requirement, 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 misunderstanding or misconception or mistake or my/our. Part of the
said requirements, covenants, stipulations restrictions and conditions.

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

5. (i) (a) I / We enclose herewith a challan for the payment of the sum Rupees
.....as Earnest Money not to bear interest (to be entered in words and figures).

5. (i) (b) I / We have paid Rs. (Rupees only as against the E.M.D. of Rs. (Rupees only) Since I am/we are and eligible to pay the E.M.D., at concessional rates.

5. (i) (c) in lieu of cash deposits, I / We have enclosed a
..... bearing No. Date
..... issued by for a value of Rs. (Rupees only) drawn/endorsed/pledged in favour of the Executive Engineer, P.W.D.,Division.

5. (i) (d) I am /We are.
an hence exempted from payment of E.M.D.

6. If my / our Tender is not accepted, this sum shall be returned tome / us on my / our applications when intimation is sent to me/us for rejection or at the expiration or ninety days from the 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 intimation being given to me/us by the authority authorized by the Government under article 299 (i) of the constitution (herein after called the accepting authority) of acceptance of my/our tender, I /we fail to make the additional security deposit, or to enter into required agreement (as specified in class IV of the tender notice) then I/We agree to the forfeiture of the Earnest Money Deposit. Any notice required to be served on me/us hereunder shall be sufficient served on me/us if delivered to me us personally or forwarded, to me/us by post to (Registered or ordinary) or left at the mail address given herein. Such notice shall, if sent by post be deemed to have been served, on me/us at the time when indue course of post, it would be delivered at the address to which it is sent.

Contractor

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

8. I/We have also signed the copy of the Tamilnadu building practice and national building code and addenda volume thereto, maintained in the
..... Division Office, in acknowledgement of being bound by all conditions of the clauses of the General conditions to the contract and all specifications for items of work described by a specification number in Schedule "A".

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

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

10. (1) In the event of the work being transferred to any other Circle / Division / Sub-Division. The Superintending Engineer / Executive Engineer / Assistant Executive Engineer who is incharge of Circle / Division / Sub-Division having jurisdiction over the work shall be competent to exercise all the power and privileges reserved in favour of Government.

Contractor

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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 Work Department Code and the site (or premises) is handed over to me/us as provided for in the said conditions and agree to complete the work within **Five 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 Tamilnadu building practice.

12. I /We agree that upon the terms and conditions of this contract, being fulfilled and performed to the satisfaction of Executive Engineer, the Security deposited by me/us as herein before cited or 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 conditions to the contract.

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

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

Sl.No.	Name of technical staff proposed to be employed	Qualification and experience
1.		
2.		
3.		
4.		

14. I /We agree that the Arbitrator for fulfilling the duties set forth in the Arbitration clause of the General conditions to the contract shall be

1. The Superintending Engineer, P.W.D., of the Buildings (C&M) Circle, **Salem** in case the value of claim does not exceeded Rs.50,000/- (Rupees fifty thousand only).
2. And through the competent civil court if they value of claim is more than Rs.50,000/-.

Signature of the contractor with date

Contractor

Sd/-
Executive Engineer, P.W.D.,
Buildings (C&M) Division, KRISHNAGIRI.1.

15. In pursuance of negotiation with the Executive Engineer / Superintending Engineer
..... of Division / Circle on

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

Sl. No.	Item No.	Schedule	Reduced rate per unit

Date :

Signature of Contractor

16. On behalf of the Governor of Tamilnadu and as duly authorized by the Governor under Article 299(1) of the constitution the above tender for a value of Rs..... (Rupeesonly) Is accepted on this dayof2012.

Signature of the witness in
full and address with name
in Block letters

Signature and Designation

Contractor

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Buildings (C&M) Division, KRISHNAGIRI.1.

Lumpsum Contract

Tender notice

For and behalf of Government of Tamilnadu sealed tender will be received by the Executive Engineer, P.W.D., Buildings (C&M) Division, KRISHNAGIRI.5. at his office upto 3.00 p.m. on **28.04.2022** for the work of

Construction of Veterinary Dispensary Building at Kelamangalam in Krishnagiri District.

The tender so received on **28.04.2022** and those received by post upto 3.00 pm on **28.04.2022** will be opened **28.04.2022** at 3.30 p.m.

The tenders should be in the prescribed form obtainable from the Superintending Engineers office. The tenders will be opened by the Superintending Engineer, P.W.D., Buildings (C&M) Circle, Salem at the place and on the date afore mentioned at 3.30pm. The tender or their agents are expected to be present at the time of opening of the tenders. The tenderer receiving officer will, on opening each tender, prepare a statement of the attested and unattested corrections therein and hand it over to the tenderer concerned and initial all corrections in the presence of the tenderers. If any tenderers of their agents finds it convenient to be presence at the time, then in such a case the tender receiving officer will, on opening the tender of the absentee tenderer, make out a statement of the unattested corrections and communicate it to him. The absentee tenderer shall then accept the statement of the corrections without any question whatsoever.

2. Tenders must be submitted in sealed covers an should be addressed to the Executive Engineer, P.W.D., Buildings (C&M) Division, KRISHNAGIRI the name of the tender and the name of the work being noted on the cover.

If the tender is made by an individual, it shall be signed with his full name and his address shall be given. If it is made by a firm, it shall be signed with the co-partnership name by a member of the firm who shall also sign his own name and the name and address of each member of the firm shall be given, if the tender is made by a corporation, it shall be signed by and 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 sent a certificate of Income Tax verification form the appropriate Income-Tax authority in the form prescribed therefore. This certificate will be valid for one year from the date of issue for all tenders submitted during the period. In the case proprietary and partnership firm, it will be necessary to produce the certificate afore mentioned for the proprietors or proprietors and for each of the partner as the case may be.

If the tenderer is a registered P.W.D., contractor and if a certificate for the current for the current year and already been produced by him during the calander year in which the tender is made, it will be sufficient if particulars regarding the previous occasion on which the said certificate was produced are given.

All tenders received without a certificate as aforementioned will be summarily rejected.

Contractor

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4. Each tenders must pay as Earnest a sum of **Rs.34,000/- (Rupees Thirty Four Thousand only)** into the branch of State Bank of India or in the Government Treasury of Sub-Treasury within the jurisdiction of the Superintending Engineer / Executive Engineer concerned to the credit or revenue deposits on behalf of the Executive Engineer P.W.D., Buildings (C & M) Division, **KRISHNAGIRI** and enclose with his tender the chalan endorsed accordingly. The earnest money deposit can also be paid in any other forms 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 tender on application, after termination is sent of rejection of the tender or at the expiration of three months from the date of tenders whichever is earlier. The refund will be authorized by the Superintending Engineer / Executive Engineer by suitable endorsement on the challan. The earnest money will not be received in cash or currency by the P.W.D. officers, have in exceptional cases. Where there are no Treasuries or banks within the jurisdiction of the officer calling for tenders. When currency notes are given, the tenderer should sign his name in full with date, on the back of all the currency notes given by him, whatever their denominations may be.

Not other mode of payment will be accepted, Bank Guarantee of any kind not be accepted.

The earnest money 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. The successful tenderer should convert the earnest money deposit already remitted into small savings script / Deposits / Accounts and pledge the same in the name of the Executive Engineer, P.W.D., Buildings (C&M) Division **KRISHNAGIRI** before signing the agreement.

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

- i. The tendrerer whose tender is under consideration shall be attend the Superintending Engineer / Executive Engineer's office before the end of the period specified by written intimation to him. If the tenderer fails to attend the office before the end of the specified period, his tender will not be considered. He shall forthwith, upon intimation being given to him of acceptance of his tender, by the officer duly authorized in this behalf under article 299(1) of the constitution, herein after called the accepting authority, make security" deposit of 2% of the value of contract in one of the forms prescribed in Tamilnadu Public works 'A' code (i.e. by taking onto account of the amount of earnest money deposit (1% of the estimate cost) already deposited with the tender, it would be sufficient to pay the balance amount to make up the 2% of the value of contract for the purpose of security deposit) The above additional security deposit at 1% will be produced before signing the agreement. The security deposit to together with earnest money deposit and the amount with held 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 is made by the contractor, he shall follow the procedure laid

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down in the proceedings paragraph for payment of earnest money deposit and such deposit shall not bear any interest.

- ii. On receipt of written communication of acceptance of tender, if the tender fails to pay the requisite security deposit within the period specified in the written communication for back out from the tender or withdraws his tender after acceptance the earnest money deposit shall be forfeited to the government.

If the contractor to carryout 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.

- iii. It shall be expressly understood by the tenderer that on receipt of written communication of acceptance of tender by the accepting authority, there emerges a valid contract between the Governor of Tamilnadu and the tenderer for execution of the work without and separately written agreement. Hence for this purpose, the tender documents, i.e. tender notice, tender offered by contractor, general conditions to the contract special conditions to contract negotiation correspondences, written communication of acceptance negotiation correspondences written communication of acceptance of tender etc., shall constitute of valid contract and there will be the foundation of the rights of both the parties to the contract.

Provided that it shall be open to the accepting authority to insist execution of any written agreement by the tenderer, if administratively considered necessary or expedient.

6. The tenderer shall examine clearly the Tamilnadu building practice and also the general conditions to contract contained therein and sign the Divisional office copy of the Tamilnadu Building practice and its addenda volume in token of such study before submitting his tender his tender unit rates, which shall be for finished work in site. He shall also carefully study the drawing and additional specifications and all the documents which form part of the agreement to be entered into by the accepted tenderer. The Tamilnadu building practice and other connected documents with the contract, such as specifications plans descriptive specification sheet regarding materials etc., can be seen at any time between 10 A.M., to 5.45 P.M. of the office days in the office the Superintending Engineer, P.W.D., Buildings (C&M) Circle, Salem - 7. A copy of the set of contract documents can also be had on payment or **Rs.9000/- (+) SGST & CGST Rs.540+540=1080/-** Each set inclusive of sales tax, surcharge thereon.

7. The tenders attention is directed to the requirements, for materials under the clause "Materials and workmanship" in the general conditions to contract, materials conforming to the ISI standards 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 site of the proposed work. He should also inspect the quarries any satisfy himself about the quality and availability of materials. The best class of materials to be obtained from the quarries or other source defined shall be used on the work. In every case the materials must comply with the relevant standard

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specifications or in the tender notice, or as required by the Executive Engineer in any case, shall be submitted for the Executive Engineer's approval before the supply to site of work is begun.

The government will not however, after acceptance of a contract rate pay any extra charges for lead or for any other reason in case the contract or is found later on to have misjudged the materials available. Attention of the contractor is directed to the standard general condition to contract regarding payment of seignior age tools etc.

9. The tenders particulars of attention is drawn to section and clauses in the standard general conditions to contract dealing with

1. Test, inspection and rejection of defective materials and work.
2. Carriage
3. Construction plant
4. Water and lighting
5. Cleaning up during progress and for delivery
6. Accidents
7. Delays
8. Particulars of payment

The contractor should closely pursue all the specification clauses which govern the rates, which he is tendering.

10. A schedule of quantities accompanies this tender notice. It shall be definitely understood that the government does not accept any responsibility on the correctness or completeness of this schedule and that this schedule is liable to alterations by omission deduction or additions at the discretion of the Superintending Engineer / Executive Engineer, Buildings (C&M) Division **KRISHNAGIRI** or as set forth in the conditions of contract.

The tenderer will however base his lumpsum tender on this schedule of quantities. In the case of percentage tender system for the work costing upto Rs.20 lakhs, the tenderer should note the tender percentage excess/less (instead of quoting specific rate for each item in the schedule for the works with reference to total estimate value put to tender. In case of other works costing more than Rs.20 lakhs he should quote rate for each item. He should quote specific rates for each item in the schedule and the rate should be in Rupees and in sum of five paises. The rates should be written both in words and figures and unit in works. The tenderer should also show the total of each of and the Grand total of the whole contract and quote in the tender a lumpsum for which he will undertake to do whole work subject to the 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, over writings, or conversations of figures, corrections where unavoidable should be made by crossing out initialing dating and rewriting.

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11. Tenderers offering a percentage deduction from or increase on the estimate amount (except in the case of tender called for specifically under the percentage rate tender system) and those not submitted in proper form or in due time will be rejected. Rates or lumpsum amount for items not called for shall not be included in the tender. No alteration which is made by the tenderer in the contract from, the conditions of contract the drawings, specifications or quantities accompanying same will be recognized, and if any such alterations are made, the tender schedule.

12. The tenderer should workout his own rates, without reference being made to the public works department current schedule of rates or the public works department estimate which are not open for inspection by tenders. However, in case tenders called for under the percentage tender system the tenderer should work out his own rate but quote his percentage rate above or below, the total estimate cost of work of the departmental indicated in the tender schedule.

13. The price at which and the source from which certain particular materials shall be obtained by the contractor and 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. Notwithstanding any subsequent change in the market value, for those materials, the charge to the contractor will remain as originally entered in the written no centage or incidental charges will be borne by Government in connection with this supply.

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

Period after date of commencement	Percentage of work completed (Based on the contract lumsum amount)
5 Months	
1 st month	20%
2 nd month	40%
3 rd month	60%
4 th month	80%
5 th month	100%

15. No part of the contract shall be sublet without written permission of the Executive Engineer nor shall transfer be made by power of attorney authorising others to receive payment of the contractor's behalf.

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

Contractor

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

18. The tenderer who are themselves not professionally qualified shall undertake to employ the qualified technical men at their cost to look after the work. The tenders 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 whether they undertake to employ technical man 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 should always be at site of the work during working hours personally checking all the items of works and paying extra attention to such works as may demand special attention e.g. reinforced concrete works etc.

Note (1) : Item (1) 2,3,4,5 should be scored-out in case where not applicable to the particular work.

Note (2): A penalty of Rs.2000/- p.m. for Diploma holder and for Rs.5000/- for degree holder, be levied in the case of default on the part of contractors in following the norms laid down above.

Note (3) : The employment of technical assistants would be based only on the value of contract, Engineers, with mechanical engineering qualification and retired from civil engineering departments are also suitable to supervise the civil engineering works because of their experience in civil engineering field.

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

Note (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.

The schedule

Value of contract	
1. Above Rs.1,00,000/- and upto Rs.5.00 lakhs	1. One diploma holder in Civil Engineering (Or) 2. Not less than one retired junior engineer.
2. Above Rs.5.00 lakhs and upto Rs.10.00 lakhs	1. One B.E., (Civil) (or) 2. Equivalent Degree holder (or) 3. 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 upto Rs.25.00 lakhs	1. One B.E., (Civil) with 3 years experience plus one Diploma holder in Civil Engineering. (or) 2. Equivalent Degree holder with 3 years experience plus one Diploma holder in Civil Engineering. (or) 3. Not less than one retired Sub-Divisional officer plus one diploma holder in Civil Engineering. (or) 4. Two Diploma Holder in Civil Engineering with 3 years and 5 years experience respectively.
4. Above Rs.25.00 lakhs and upto Rs.50.00 lakhs	1. One B.E., (Civil) with 3 years experience plus two Diploma holder in Civil Engineering. (or) 2. One B.E., (Civil) with 3 years experience plus two retired junior Engineering. (or) 3. Equivalent Degree holder with 3 years experience plus two Diploma holders in Civil Engineering / twos retired junior engineers. (or) 4. One retired Sub Divisional Officer (AEE or ADE) plus two Diploma Holders in Civil Engineering. (or) 5. One retired Sub Divisional Officer (AEE or ADE) plus two retired Junior Engineers.
5. Above Rs. 50.00 lakhs contractor In addition to the Technical personal proposed for values above Rs.25.00 lakhs and upto three years experience shall be employed.	To be examined in individual cases depending on the nature or work and the technical skill involved and to be defined at appropriate me.

19. The contractor should offer employment to ex-toddy tappers as per as possible. The number of ex-toddy tappers to whom he can so offer employment should be mentioned in the tender and the should under take in the agreement to offer such employment to such number.

20. The contractor shall employ 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, this failure will be 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 penalties for the breach of contract provided in the conditions of contract. The contractor shall also be liable for any pecundary liability arising on account of any violation by him of the provisions of the Act contractor shall during the currency of the contract ensure

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engagement to the apprentices is 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 liability to make payments to the apprentice as required under the said Act.

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

Unless the contractor has been exempted from engagement of apprentices by the director of employment and training / state apprenticeship advisor a certificate to the effect that the contractor had discharged his obligation under the said Act. "Satisfactory" 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 there of 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 contractor shall be solely responsible for the payments of Sales Tax under the provisions of the Madras Contral Rules tax Act 1939 (Madras Act II of 1939) an inforce for various items of work time being and the rates for the various items of work shall remain unaffected by any 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 challans produced to the departmental officers.

23. Statement given brief particulars of equipment and resources that will be put at disposal of the work under the following classifications should accompany the tender.

- 23.a.
1. Lorries
 2. Concrete Mixers
 3. Needle Vibrator
 4. Mechanical spray set for curing
 5. Building host
 6. Centering materials or very good quality
 7.
 - a. Column moulds atleast 50% of column sizes provided in plain
 - b. Organisation (i) Technical (ii) unskilled
 - c. Resources in materials like teakwood etc., and extent upto which departmental help required for procurement of materials and transport of same.

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24. The Superintending 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.

25. Additional security to be furnished for the lesser rates

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 out of 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 Superintending 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.

SCHEDULE – A

Schedule of rates and approximate quantities

1. The quantities here given are those upon which the lumpsum tender cost of the work is based but they are subject to alterations, omissions, deductions or additions as provided for in the conditions of this contract and do not necessarily show the actual quantities of work to be done. The unit rates noted below are the governing payment for extra or deductions for omissions according to the conditions of the contract as set forth in the general conditions of contract of TNBP and other condition conditions (or) specifications of this contract.
2. it is to be expressly understood that the measured work is to be taken that (Not withstanding any custom or practice to the contrary according to the actual quantities when in place and finished according to the drawings or as may be ordered from time to time by the Executive Engineer and cost calculated by measurement or weight at the respective prices, without any additional charge for any necessary and contingent works connected therewith. The rates quoted are for works in site and complete in every respect.

Item No.	Probable qty (Figures)	Description of Work	TNBP No	Rate (Words & Figures)	Unit(in words)	Amount (figures) Rs. P
		Vide separate schedule attached				

Signature of Contractor : (Vide separate sheet attached)

Issued to

.....on.....

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EXTRACT OF AMENDMENT

Amendment to clause 69.1 of General Conditions, contract based on orders in G.O.Ms.No.1152/PW/DT.19.6.80.

MODIFICATION AND AMENDED IN G.O.Ms.No.

Cause – 69-1 – of General conditions of contract :

In case of 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 the matters left to the sole discretion of the Executive Engineers under clause 18,20,25-3-27-1, 34, 35 and 37 of General conditions of contract or as to the withholding by the Executive Engineer of the payment of any bill to which the contractor may claim to be entitled, the either party shall forth with give to the other notice or such of difference and dispute or difference shall be and is hereby referred to the arbitration of the Superintending Engineer of the nominated circles mentioned in the articles of agreement (herein after called the Arbitrator) in cases where the value of claim is less than or upto Rs.50,000/-.

In case where the value of claim is more than Rs.50,000/- the parties will seek remedy through the competent civil court.

SPECIAL CONDITION FOR ERRADICATION OF CHILD LABOUR

G.O.(MS) No.53 Labour and Employment (V II) Department/Dated 12.5.03

The work contract assigned to the Contractor's shall be cancelled if they engage Child Labour in executing works and such Contractors should be, black listed for three years.

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PART –IV

SPECIAL CONDITIONS

1. Clean fresh water and river sand shall be used in all class
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 36 General conditions of contract regarding water and lighting.
3. The broken stone for concrete and RCC works should be graded and passed by the Executive Engineer.
4. All iron work or steel work of every kind except steel rods that are to be embedded in cement concrete shall immediately arrive at the site and properly scrapped and wire brushed and given a printing coat of approved lead pointing without claiming extra.

5. HOLDFASTS :

Iron holdfasts shall be fixed in the walls using cement mortar 1:3 for that portion of fixing at the time of construction of walls. It should be mixed with cement concrete 1:3:6 using 20mm gauge broken granite stone jelly for proper anchored and binding. No separate rate for such pockets of concrete filling at holdfast points and for using C.M. 1:3 for that portion, will be allowed and this will be measured as masonry along with adjacent masonry.

6. WOOD :

Teakwood shall be best Indian Teakwood only and shall be subject to inspection and approval by the Executive Engineer before use on the work. Country wood where specified shall be Karumarudu, Pillamarudu, Kongu, Veteak for scantling and Manja Kadambu, Aiyini for planks as may be specified and approved by the Executive Engineer.

7. Holes and charges of electric wiring, water supply and drainage etc., shall be provided as directed during progress of work without any claiming extra.
8. The work will be carried out with the least hindrance to the adjoining building and offices and the contractor will be responsible for any damages, caused to the existing fixtures electric fittings etc., in the course of execution and the contractors shall make good of damage without claiming extra.

9. T. BEAMS :

In the of 'T' Beams and ELL beams the quantity given in the schedule is the quantity of the rib portion only. The top flange portion will be always measured with the general slab portion and paid for at the slab portion only. For all RCC works the rate shall include the treatment of bearing as per specification No. 30 of TNBP.

10. CONCRETE WORKS :

All exposed concrete surface will be required to be finished by cement plaster as per specification No. 30E (a) of TNBP.

11. PLASTERING CONCRETE :

All corners shall be finished sharp using C.M. 13 not exceeding 3 inch width on each side of the corner. So also the edges of beams of door and windows opening soffits, shall be finished sharp using rich mortar and finished truly vertical or horizontal as the case may be. The unit rate quoted by the contractor for plastering shall be inclusive of the cost of finishing as above and so separate claim for extra rate will not be entertained. However, the cement utilized for the work will be taken into consideration in the adequacy statement for issued of departmental cement to the contractor.

12. WORKS IN DIFFERENT FLOORS:

If separate rate is not called for, for execution of similar items of work in different floors, then, single rate quoted will alone be entertained uniformly for execution of such items of works in different floors. No claim for extra rate will be entertained under and circumstances.

13. The Superintending Engineer reserves the right to split up the work and entrust the main work, internal water supply and sanitary arrangements to different contractors.

14. The protection if any to the masonry will be measured under the relevant items and no extra will be paid for finishing the same.

15. Payments for centering works for all RCC items shall be made only after the concrete is laid, eventhough separate rate is called for, for centering works in the schedule.

16. Concrete For R.C.C. works

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

Additional specifications :

1. The arrangements of M.S. Rods for reinforcement for such RCC works shall be in accordance with departmental drawing supplied.
2. The planks for forms and centering for RCC works shall be of well seasoned timber approved by the Executive Engineer according to clause 8 of TNBP 30. They must be made smooth and even perfectly level to top so as to give smooth and even finish to the RCC ceilings alternatively the contractor should use steel sheets over wooden firms centering and form work shall be provided to the extent and as ordered by the Executive Engineer during the execution
3. All time mortar shall be ground mixed in mortar and will be as per T.N.B.P.
4. M.S. 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.
5. Ordinary the contractor shall be responsible for the collection of all materials required for the work.

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6. The required G.I. Pipes if available will be supplied free of cost of site of work. The Scurplus G.I. Pipes if any will be returned in good condition to the department failing which double the cost at market rate plus centage charges will be recovered form the contractor.

7. Construction Materials;

Supplemental to clause of any 20 of General conditions.

7.1 Cement :

The contractor has to make his own arrangements for the procurement of cement to required specification for the works subject to the followings.

- a. The contractor shall procure cement required for the works only from reputed cement factories (Main producer or their authorized agents, manufacturing cement at I.S.I. standard) acceptable to the Engineer-in-charge. The contractor shall be required to furnish to the engineer – in- charge bills of payment and test certificates issued by the manufactures or their authorized agents to auth-enticate 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 standard packing of 50 kg per bag from the authorized manufactures. The contractor shall make necessary arrangements at his own cost to the satisfaction of Engineer-in-charge for actual wightment of random sample from the available stock and shall conform with the specification laid down by the Indian standards institution or other standard foreign in situation as the case may be cement shall be got tested for all the tests as directed by the Engineer-in-charge atleast one month on advance before the use of cement bags brought and kept on site godown.
- c. The employer will furnish air retraining 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 tendered for concrete.
- d. The contractor should store the cement of 60 days requirement atleast one in advance to ensure the quality of cement brought to site and shall not remove the same without the written permission of engineer-in-charge.
- e. The contractor shall forth with remove from the works area and cement that the Engineer-in-charge may disallow for use on account of failure to met with required quality and standard.
- f. The contractor will have to construct sheds for storing cement having capacity not less than the cement required for 90 days use at approved locations. The Engineer-in-Charge of the representative shall have free access to such store at all times.

- g. 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 proofs as directed that the cement is being used as tested and approved by Engineer-in-charge for the purpose and the contractor shall at all times, keeps his record upto so as to enable the Engineer-in-Charge to apply such checks as the may desire.
- h. 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 area any cement the Engineer-in-charge may disallow for use of work and replace by cement complying with the relevant Indian standards.

7.2 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 affix I.S.I. test certificate issued by the Govt. approved laboratory certification marks and acceptable to the Engineer – in – Charges, necessary I.S.I. test certificate are to be produced to Engineer-in-charge before use on works.

The diameters and weight of steel should be as follows:

S. No.	Diameter of rod		Sectional weight in kg per running metres both for plan & HYSD steel
1.	6	Millimeters	0.22
2.	8	Millimeters	0.39
3.	10	Millimeters	0.62
4.	12	Millimeters	0.89
5.	14	Millimeters	1.21
6.	16	Millimeters	1.58
7.	18	Millimeters	2.00
8.	20	Millimeters	2.47
9.	22	Millimeters	2.98
10.	25	Millimeters	3.85
11.	28	Millimeters	4.83
12.	32	Millimeters	6.31
13.	36	Millimeters	7.99
14.	40	Millimeters	9.86

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

Act NO. 15 of 1999, Tamil nadu General Sales Tax (Fifth Amendment)

In let further to amend the Tamil Nadu General Sales Tax, Act 1959

1. (1) This Act may be called the Tamilnadu General Sales Tax (Fifth Amendment) Act 1999.

(2) It shall come into force on such date as the State Government may by notification, appoint.

2. After section 7-F of the Tamil Nadu General Sales Tax Act 1959, the following section shall be inserted namely.

7-F Deduction of tax at source in works contract (1) not with standing anything contained in this Act, every person responsible for playing any sum to any dealer for execution of works contract shall at the time of the payment of such sum, deduct an amount calculated at the following rate, namely

(i) Civil Works Contract – Two percent of the total amount payable to such dealer

(ii) All other works contract – Four percent of the total amount payable to such dealers.

Provided that no deduction under sub-section (1) shall be made where.

- a. no transfer of property in goods (whether as goods or in some other form) is involved in the execution of such works contractor.
- b. The dealer produces a certificate from the assessing authority concerned that the he has no liability to pay or has paid the tax under section 3-B or section 7-C, or
- c. Declared goods are purchased from a registered dealer dealer within the state and of works contract in the same form in which such goods were purchased.

Provided further that no such deduction shall be made under this section where the amount or the aggregate of the amount paid or credited or likely to be paid or credited, or likely to be paid or credited, during the year by such person to the dealer for execution of the works contract including civil works contract does not or is not likely to exceed one lakh rupees.

Explanation, for the purpose of this section

(i) the term person shall include

- (a) the central or a stage government
- (b) a local authority
- (c) a corporation or body established by or under a central or state Act,
- (d) a company incorporation under the companies Act. 1956 (Central Act 1 of 1956), including a central or state government undertaking.
- (e) a society including a Co-operative society
- (f) an educational institution (or)
- (g) a trust

(ii) the term “Civil Works Contract” shall have the same meaning as in the Explanatio to section 7-c.

1. Any person making such deduction shall deposit the sum so deducted to such authority in such manner and within such time, as may be prescribed.
2. Any person who makes the deduction and deposit, shall within fifteen days of such deposit issue to the said dealer a certificate in the prescribed form for each deduction, separately and send a copy of the certificate of deduction to the assessing authority, having jurisdiction over the said dealer together with such documents, as may be prescribed.
3. On furnishing a certificate of deduction referred to in sub-section (3) the amount deposited under sub-section (2), shall be adjusted by the assessing authority towards tax liability of the dealer under section 3-B or section 7-c, as the case may and shall constitute a good and sufficient discharge of the liability of the person making deduction to the extent of the amount deposited.
4. Any person who contravenes the provisions of sub-section (1) or subsection (2) shall pay in addition to the amount required to be deducted and deposited interest at two percent per month of such amount for the entire period of default.
5. Where the dealer proves to the satisfaction of the assessing authority that he is not liable to pay tax under section 3-B or section 7-C the assessing authority shall refund the amount deposited under sub-section (2) after adjusting the arrears of tax if any due from the dealer in such manner as may be prescribed.
6. The tax or interest under this section shall become due without any notice of demand on the date of actual for the payment by the person as provided under sub-sections (1) and (2).

(By order of the Governor)

ADDITIONAL CONDITIONS : 1

1. The contractor be responsible for the safe custody and storage of materials under any conditions of the places where the works are approved by the Executive Engineer.
2. No royalty shall be charged where due for materials, quarried from the public works department of district board of their government quarries, assistance as necessary will be given to the contract by the P.W.D., to obtain access to quarries approved by Executive Engineer. No plot rent shall be charged for materials stocked in the Government land during the course of construction provided such materials are removed within the month-after the works is completed.
3. Royalty (or) charges due for use of private quarries and private and shall be paid by the contractor.
4. The contractor shall form his own approach road to the works 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 used the existing road he shall maintain them in good condition at his own cost, throughout the period of the contract.
5. Any surplus materials remaining at the site will not be generally taken over by the department whether before or after the completion or determination of contract. Such materials either which were originally produced by the contractor (or) were issued to them by the department and charged to their accounts are the property of the contractors and can however be taken over by the department if required for use on other which are in progress only the special arrangements and at the prevailing market rates viz., the rates at which the article or articles of a similar description can be procured at a given time from public market.

If the materials were originally used by the departments the price allowed to the contractor on requisition shall not exceed the amount charged to the contractor excluding the cost of storage charges if any.

6. The surplus materials which were originally issued to the contractor by the department for use in 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 35,36 and 37 if TNBP and he is requested to provide at his own expense sheds, latrines and urinals for his workers.
8. If night works is required to fulfill the agreed rates of progress all arrangements shall be made by the contractors inclusive of lighting without any claim for extra rates.
9. The contractor shall not employ the labour below the age of 12 years and shall also note that he must offer employment to Ex-servicemen extoddy tappers and unemployed agricultural labourers as far as possible.
10. Any of the item in the schedule may be omitted or radically altered. No variation in rate shall become payable to contractor on account of such omissions (or) variation in quantities.

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11. References to TNBP in the schedule of quantities referred to printed. 1985 and 1988 and addenda and corrigenda issued thereafter.
12. The construction of building will be deemed to be completed only if any items of works including finishing items of works contemplated therein are executed.
13. The contractor shall abide the contractor's labour regulation or the P.W., Framed by the Tamilnadu Government.
14. In respect of all contract with contract value exceeding Rs.5,000/- income tax 2% of the gross of amount irrespective of the bill amount payable to the contractor will be recovered at source.
15. the sales tax clearance certificate should be furnished before the finalization of contract.

16.(a). E.M.D:

The acceptance of E.M.D. in various approved forms is subject to the specific condition that the successful tenderer should pay the security deposit (including E.M.D.) in the form of small savings scripts duly pledged in favour of the Executive Engineer concerned in lieu of other mode of payment made for E.M.D.

(b) Security deposit:

In case of contractors for building works the security deposit (i.e.2%) of the value of contract minus the E.M.D. already remitted is to be produced in the shape of small saving scripts, deposits, accounts duly, pledged to Executive Engineer, PWD of the Division concerned before signing the agreement.

17. Sales Tax:

All rates quoted in the tender shall be inclusive of Sale Tax payable under General Sales Tax act as amended from time to time including amended act of 28.84 and the contractor is responsible to file sales tax return and pay the amount of tax as demanded by the commercial tax department. No request for payment of sales tax separately in addition to tendered. Sales Tax due to any plea of subsequent levy (or) increase in tax will not be entertained. Vide also clause 38 (2) of general conditions to contract.

18. Risk Insurance :

The work executed by the contractor under these contract shall be maintained at the contractors risk, until the work is taken over by the Executive Engineer. The Government shall not be liable to pay for any loss or damages occasioned by or arising out of fire, flood, volcanic eruption, earth quake, other convulsion of nature calamities, risks arising out of acts of God during such period and that the option whether to take insurance coverage or not to cover such risks is left to the contractor.

19. Standard specifications:

For detailed description of various items of works to be executed in addition to the brief description given in the schedule A and for the rights and obligations of the contractors etc., the attention of the contractors is invited to Tamilnadu building practice which should be followed in all respect both in latter and spirit. The materials used, the workmanship, the mode of execution of the work etc., should confirm the relevant specification on TNBNP.

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20. Safety code:

The safety measures and all amenities for the labours shall be made by the contractor at his cost as indicated in the safety code vide appendix to general conditions to contract and clause 34,35 and 42-1 to 42-7 of general conditions of contract.

21. Retention of 2 ½% for one year:

In case of contracts for construction of buildings either permanent (or) semi-permanent buildings a sum equivalent to 2 ½% of the value of work done will be retained with the Government for a period of one year reckoned from the date of completion of the work done by the contractor. The amount so retained with the Government will be refunded only on expiry of one year period referred to above and on execution of indemnity bond by the contractor for a further period of four years.

The contractor shall be liable to set right all defects arising out of his faulty execution (or) sub-standard work noticed during the above five years period at his cost.

22. Recovery of dues under revenue recovery act:

Any amount fallen due from the contractor on account of this contract even after recovering from the bills for this work and any other contract awarded to the contractor than the amount is liable to be recovered under the provision of Revenue Recovery Act.

Additional condition of contract : 1

1. The contractor shall at his own expense provide arrangement for the provision of footwear for any labour doing cement mixing work and all other similar type of work involving the use of tar mortar etc, to the satisfaction of the engineer incharge and on his failure to do so Govt. shall be entitled to provide same and recover the cost from the contractor.
2. when there are complaints of non payment of wages to the labour bills of the contractor may be with – held pending a clearance certificate from the labour department.

ADDITIONAL CONDITIONS. III

Rules for the provision of Health and Sanitary arrangements for workers employed by the P.W.D., and their contractors.

The contractor's special attention is invited to relevant clauses of general conditions of contract in the TNBP and he is requested to provide at his own expense the following amenities to the satisfaction of the Executive Engineer.

1. First Aid :

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

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2. Drinking water:

1.

- a. water of good quality fit for drinking purpose shall be provided for the workpeople on scale not less than fifteen litres per head per day.
- b. Where drinking water is obtained from an intermittent public water supply system 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 of not less than 15m from any latrine drain or sources of pollution where water is to be drawn which is within such proximity of latrine drain or any other source of pollution the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be entirely closed in and be provided with a trap door which shall be dust and water proof.

2. 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 at least once in a month.

3. Washing and bathing places

Adequate washing and bathing places shall be provided separately for men and women, such bathing place shall be kept in clean and drained condition bathing (or) washing should not be allowed in or near any drinking well.

4. Latrines and urinals

They shall be provided within premises of every work place latrines and urinals in an accessible place and the accommodations separately for each of them shall be on following scale or on the scale as directed by Executive Engineer in any particular use.

1. Where the No. of persons employed does not exceed 50-2 seats
2. Where the No. of persons employed excess 50 but does not exceed 100-3 seats.
3. For every additional 100 persons- 3 seats. If women are employed separate latrines and urinals screened from these for Men shall be provided on the same scale. Except in work place provided with water flush out latrines connected with a water borne sewage system all latrines shall be provided with receptacle on dry earth system which shall be cleaned at least four times daily and at least twice during working hours and kept in strictly sanitary condition. The receptacles shall be tarred inside and outside at least once a year.

The excreta from the latrines shall be disposed off at the contractor's expenses in outway pipe approved by the local public health authority. The contractor shall also employ adequate No. of scavengers and conveyance staff to keep the latrines and urinals in a clean condition.

5. Shelters during rest

At every work site there shall be provided free of cost two suitable sheds one for meals and other for rest separately for men and women for the use of labourers.

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6. Creches :

At every work place at which 50 or more women ordinary employed there shall be provided two huts of suitable site 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.

1. thatched rooms
2. mud floors and walls
3. plants spread over the mud floor and covered with metting.

The site of the crèches should vary according to the No. of women workers. The creches should be properly maintained and necessary equipment like toys etc., shall be provided huts shall be provided with suitable and sufficient sweepers to keep the place clean. There shall be Aayas in readiness, Sanitary urinals shall be provided to the satisfaction of the health officer of the are concerned.

The No of huts shall be restricted to children their attendants and mothers of the children.

7. Canteen:

Cooked food canteen on a moderate scale shall be provided for the benefits for the workers as it is considered expeiant.

8. Sheds for workmen

The contractor should provide at his own expense ahead for housing the workmen. The sheds shall be on standard not less than the cheaper shelter type to live in which the work people pertaining in the locality are accustomed to. A floor area of 1.80 mx1.30m for two persons shll be provided. The sheds to be in rows with 1.3 m a clan space between sheds and 9m clear space between rows if condition permit. The work people camp shall be laid out in units of 400 persons each unit to have a clear space of 12m alround.

Additional condition: IV

Safety provision in the building industry condition in addition to clause 42 of preliminary specification T.N.B.P.

Article-1:

PART -1

1. suitable scaffolds shall be provided for workmen for all work that cannot be safely done from ladder or by other means.
2. A Scaffold shall not be constructed taken down or substantially altered except.
3. a. under the supervision of the competent and responsible persons and
b. By as far as possible competent workers possessing adequate experience in such kind of work.
4. Scaffolds shall be so constructed that on part thereof can be displaced in consequence of normal use.
5. Scaffolds shall not be over loaded one as far as practicable the load shall be evenly distributed. Before installing lifting gear or scaffolds, special precaution shall be taken to ensure the strength and stability of the scaffolds.
6. scaffolds shall be periodically inspected by a competent persons.
7. Before allowing a scaffold to be used by the workmen every employer shall whether the scaffold has been erected by his workmen or not take steps to ensure that it functions full with the requirements of this articles.

Article -2.

1. Working platforms gangways and stairways shall be so constructed that part thereof can save unduly (or) unequally.
2. To be so constructed and maintained to obviate from risks of persons tripping or slipping and to be kept free from any un-necessary obstructions.
3. Every working platform gangway working place and staircase shall be suitably tested.

Article -3.

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

Article -4:

1. Safe means of access shall be provided to all at working platforms and other working places.
2. Every ladder shall be securely fixed and of such length as to provide securely hand – hold and foot hold t every position which it is issued.
3. Every place where work is carried out 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 matter is on the site shall be constructed or placed as to cause danger to any persons.

Article -5 (General rules as to hosting appliance : Article :3)

1. Hoisting machines and tackle including their attachments encharges and supports shall
 - a. Be of good mechanical constructions sound materials and adequate strength and free from patent effect and to be kept in good working order.
 - b. Every rope used in hoisting or lowering materials on as a means of suspension shall be suitable quality and adequate strength and free from patent defect.

Article -6:

1. Hoisting machines and tackle shall be examined and adequately tested after erection on the site and before use and re-exaimed in position at intervals to be prescribed by national law of regulations.
2. Every chain ring, book shackle level 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 and
2. No persons under the age of 21 years shall be in control of any hoisting machine including any scaffold which or give signals to the operator.

Article -8:

1. In the case of every hoisting machine and of every chaining hood shackle, level 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 above shall be plainly marked with the safe working load. 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.
3. No part of any hoisting machines of any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.

Article -9:

1. Motor gear, transmission electric, wiring and other dangerous part of hoisting appliance shall be provided with efficient safe guards.
2. Hoisting appliances shall be provided with such mean as will request to a minimum the risk of the accidental descent of the
3. Adequate precautions shall be taken to reduce to a minimum the risk of any part of a suspended load been wing accidentally displaced.

PART –III**GENERA 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 provided and the employer shall take adequate steps to ensure proper use of the equipment by these concerned.

Article -11:

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

Article -12:

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

Article -13:

Where large work places are situated in cities, town or in the sub-urban and no beds are considered necessary owing to the proximity of city or town hospital, suitable transport shall b e provided to facilitate removal of urgent cases to hospital at other work places, some conveyance facilities such as care shall be kept readily available to taken injured persons or persons suddenly taken seriously ill to the nearest hospital.

General specifications:

1. Cement concrete flooring tiles shall be manufactured from mixer of cement natural aggregates and clouring materials where required by pressured process. Fixing manufacture, the tiles shall be subjected to a pressure not less than 140kg/cm².
2. Proportion of cement to aggregate in the backing of the tiles shall be not less than 1:3 by weight.
3. On removal from mould, thatile shall be kept in moist continuously atleast for 7 days and subsequently if necessary for such a longer period that would ensure their conformity to the requirements to Trayanse strength resistance of wet and water absorption and would minimize shrinkage and cracking, tiles shall be stored under covers.
4. Tolerance : tolerance on length and breadth shall be plus or minus one millimeter. Tolerance thickness shall be plus 5mm, the range of dimensions if any of one delivery of tiles shall not exceed 1mm., length and breadth and 3mm., on thickness.

5. THICKNESS OF WEARING LAYERS:

Class of tiles	Minimum thickness of wearing layer
Plain cement and plain coloured tiles general purpose.	3 mm
Plain cement and plain coloured tiles for heavy duty	6mm
(Mosaic) terrace tiles with chips of size varying from the smallest upto 6mm.	5mm
(Mosaic) terrace tiles with chips 12mm size ranging from the smallest upto 12mm, or ½"	5mm
(Mosaic) terrace tiles with chips of size varying from the smallest upto 20mm or ¾"	6mm

6. Colour and appearance: The colour and texture of the wearing layer shall be uniform through its thickness.

7. When specifying the tiles, the contractor should specifically indicate whether the chips to be used are from the smallest to 20mm, size. The officers of the department shall also specify size of chips by referring the approximate photograph given in indian standard No. 1237/1959.

8. Genera quality of tiles

Unless otherwise required the wearing face of the terrace tiles shall be mechanically round and filled. The bearing face of the tiles shall be placed, free from projections, depression and bracks (Haircracks not included) and shall be reasonably paralalled to the backface of tiles. All angles shall be right angles and all edges shall be sharp and true.

9. BREAKING TRAVERSE STRENGTH OF TILES SHALL BE GIVEN AS BELOW:

Size of tiles cm.	Span cm.	Breaking wet test cm. kg.	Land based dry test Kg
19.85x19.85	15	71	105
24.85x24.85	20	90	120
29.85x29.85	25	99	149

10. The average wet of not less than 12 specimens shall not exceed 2mm., and the weather any individual specimen shall not exceed 2.5cm., when tested in an abrasion testing machine.

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

12. The density of the tiles shall be in the order of amount 2.4gms. the tiles shall belaid with the minimum possible width of joints and not exceeding 1/32 inches. The joints shall be filled with grey cement to match the finish of the tiles and shall be made almost invisible when the floor 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 wall coves and other areas where the machines can have not access and glossy, surface as even as possible.

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All angles at junction of vertical faces shall be rounded of the 11/2" radius with same quality of materials and colour of the tiles of the floor. But laid in situ and these coves shall be measured as part of flooring and paid for at the same rates and the flat floors. The colours of the tiles shall generally match other coloured face adjustment or as may be directed by Executive Engineer.

The dadoing and skirting have to be finished by giving necessary, faces in the brick wall itself so that the projection does not exceed 1/2" from the face of the wallies, the finish plastered surfaces.

Based on the modulus of rupture of 30kg sq m for dry test and two thirds of the value of wet test.

GUIDELINES FOR ADDITION OF STRENGTH GARDENING OF CONCRETE:

Plain and reinforced concrete have been graded according to the cube compressive strength and designated as M100. M150. M200. M 250. M300 and M400 the designation of concrete the letter refers to the mix and the Number to the specified 28days work cube compressive strength of that mix expressed in Kg/cm².

Approximately the M.100 M150. M200 and M250 grades of concrete corresponds 1:3:6, 1:2:4 , 1:1 1/2:3, 1:1:2 nominal mixes of ordinary concrete used.

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

For any particular item, compressive strength required to be obtained by the concrete at 26days in the preliminary and works tests on the 15cm. cubes minimum cement concrete required to be used and the approximate proportions of 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 the contract, contractor shall inform the executive engineer, the exact location of the source of the materials where he proposed 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 the specified strength in the preliminary test 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 works tests also show the required strength.

If during the progress of work the contractor wishes to change the materials the proportion shall be mixed 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.

PROPORTIONATE OF MIX:

Each batch of mix shall be proportioned to weight of cement fine aggregate and coarse aggregate water for each batch shall be added in quantity measured by volume or by weight, where weight of cement as determined by accepting the maker's weight per bag a reasonable number of bags shall be weighted separately to check net weight, where the cement is weighted on the site and not in bags its shall be weighted separately from the aggregates. All the weighting equipments shall be maintained in a clean and serviceable condition and their accuracy checked periodically.

Mixing:

Mixing shall be done only by mechanical mixers. The quantities of the aggregate and water shall be adjusted duly in the field to compensate for bulkage due to the quantity of moisture present in the fine 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 tests

If concrete mixers are specified by its strength then the mix shall be designed and preliminary tests should be carried.

A preliminary test is conducted in a laboratory of the trial mix of concrete produced in the laboratory with the object of:-

- a. designing of concrete mix before the actual concrete operation starts.
- b. Determining the adjustments required in the designed mix or when there is change in the materials used during the execution of work.
- c. Verifying the strength of concrete mix.

B. works tests :

The test conducted either in the field or in a laboratory on the specimen made on the works out of concrete being used on the works.

The sampling shall be spread as evenly as possible throughout the day, when wide changes in weather conditions occur during concreting additional samples may be taken as desired by Executive Engineer.

All expenses on the tests shall be borne by the contractors nothing extra shall be paid to the contractor for carrying out the tests.

All samples for tests shall be taken in the presence of Assistant Executive 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.

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1. Name of the work and reference to agreement
2. Sl.No.
3. Date and time of sample taken
4. Sample No.
5. No. of cube
6. Identification works
7. Proportions of mix
8. Description of the portion of work represented by the sample and quantity of concrete represented by the sample.
9. Initials of Assistant Executive Engineer and contractors authorized agent in whose presence sample is taken.
10. Result of 7days test.
11. Result of 28 days test
12. Review remarks by Executive Engineer.

Extract of : IS 456 – 1964

4.2.2.1 :Plain and reinforced concrete shall be in seven graded designed M100, M150, M200, M250, M300, M350 and M400.

Note: in the designation of the concrete mix, letter M. refereed the mix., and the number to the specified 28 days works cube compressive strength of that mix expressed in kg/cm².

4.2.2.2. Strength requirements of concrete

4.2.2.2.1 when a ordinary Portland cement or Portland blasurnace stag cement conforming to accepted standards (vl.5) (21/2 is used the compressive strength requirements for various grades of concrete shall be as given in Table I. Where rauid hardening Portland cement is used the 20 days compressive, strength requirement specified in Table 1. Shall be met at 7days, where other cements are used the Engineer incharge shall specify the corresponding requirements preferably on the basis of preliminary tests.

*IS 269/1458 specification for ordinary rapid hardening and low heat Portland cement is 455/1962 specification for Portland blast slab cement.

4.2.2.2.2.3 strength requirements specified in Table 1 shall apply to both controlled concrete and ordinary concrete (Sec. 4.3.1) preliminary tests need not however be made in the Case of ordinary concrete.

1. In order to get a relatively quicker idea of the quality of concrete, optional works tests on beam for module or reputure at 72+2 hours of at 7days, or compressive strength tests at days may be carried out in addition to 28days compressive strength tests. In all cases, the 28days compressive strength specified in Table 1 shall alone in the criteria for acceptance or rejection of the concrete. If however, from tests carried out in a particular job over a reasonably long period it has been established to the satisfaction of the Engineer incharge that suitable ratio between the 28days compressive strength and the modulus of reputure at 72+2 hours or at 7 days or

compressive strength at 8 days may be accepted the Engineer incharge may be suitably relax the frequency of 28 days compressive strength test specified in the table 5 provided the expected strength values at the specified early age are consistently met. For this purpose the values given in Table 2 may be taken for general guidance in the case of concrete made with ordinary cement.

b. where the strength of concrete mix, as indicated by tests, lies between strength 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 grades between which its strength lies.

4.3 PROPORTIONING AND WORKS CONTROL

4.3.1 methods of proportioning the determination of preparations of cement aggregate and water to attain the required strength shall be made by one of the following.

- a. With preliminary tests by designing the concrete mix such concrete shall be called controlled – concrete.
- b. Without preliminary tests by accepting nominal concrete mixes such concrete shall be called “Ordinary Concrete”.

4.3.2.1 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 structure shall be in grades M100, M150, M200, M250, M300, M350 and M400.

4.3.2.2 : The concrete mix shall be designed to have an average strength corresponding to the values specified for preliminary tests in Table.1. The proportions chosen should be such that the concrete inadequate workability for the conditions prevailing on the work in question and may be properly compacted with the means available.

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

4.3.2.3 Except where it can be shown to the satisfaction of the Engineer incharge that supply of properly grade aggregate of uniform quality can be maintained over the period of works the grading of aggregate should be controlled by obtaining, the coarse aggregate in different sizes and blending them in the right proportions when required, the different sizes being stocked in separate stock piles the materials should be stock piles 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, incharge to ensure that the suppliers are maintaining the grading uniform with samples that of the samples used in the preliminary tests.

4.2.3.4 impropportioning 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 a reasonable number of bags, should be weighted separately to check the net weight. Where the cement is weighted on the site and not in bags, it should be weighted separately from the aggregates. Water should on either measured by volume in colibrated tanks (or) weighted all measuring equipments should be maintained in a clean serviceable condition and their accuracy periodically checked.

4.2.3.5 it is most important to maintain the water cement ratio constant at its correct value. To this end determination of moisture contents in both find and coarse aggregate should be made as frequency as possible the frequency for given job being determined by the Engineer incharge according to weather conditions the amount or the added water should be adjusted to compensate for any observed variations in the moisture contents. For the determination of moisture content in the aggregate is /2386 part III 1963. Methods of test for aggregate for concrete part III specific gravity, density, voids, obsorption building, may be referred to allow for the variation in weight of aggregate due to variation their moisture content suitable adjustments in the weights of aggregates should also be made.

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

4.3.2.7 Workability of the concrete should be checked at frequent intervals, the slump test or where facilities exist, the compacting factor test – in accordance with IS-1199 and 1950 may be adopted for this propose.

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

4.3.3 Ordinary concrete:

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

4.3.3.2 Inproportioning concrete, the quantity of cement should be determined by weight. The quantities of fine & course aggregate may be determined by volume, but these should also preferably be determined by weight. In the latter case the weight should be determined form the volume specified in table III and the weight per litres of dry aggregate. If fine, aggregate is moist and volume batching is adopted. Allowances shall be made for bulking in accordance with IS.2386/ Part III -1963.

4.3.3.3. The water cement ratio shall not be more than these specified in Table III.

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

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

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

4.3.3.4 Workability of the concrete should be controlled by directed measurement of water content, making allowance for any surface water in the fine and coarse aggregates. The slump test in accordance with IS 1199/1959 may be used as guide.

4.3.3.5 Allowance should be made for surface water present in the aggregate when computing the water content, surface water shall be determined by one of the field methods described in IS 2336/Part III 1963. In the absence of exact data the amount of surface water may be estimated from the values given in Table 4.

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

In accordance with Table III shall not, however be placed in a higher grade on the ground that the test strength and 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 IS 516-1959.

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

TABLE -1 STRENGTH REQUIREMENT OF CONCRETE**CLAUSE 4.2.2.1 AND 4.2.2.2**

All values in Kg/Cm².

Grade of concrete	Compressive strength of 15cm., cubes at 28days after mixing conducted in accordance with IS 516-1959	
	Preliminary test Min	Works test min
M.100	135	100
M.150	200	150
M.200	260	200
M.250	320	250
M.300	380	300
M.350	440	350
M.400	500	400

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

- Designing a concrete mix before the actual concreting operations starts.
- Determining the adjustments required in the designed mix when there is a change in the materials used during the execution (or)
- Verifying the strength of concrete mix

Note 2 : Works Table – All test conducted either in the field or in a laboratory in the specimens made on the works out of the concrete being used on the works.

Note 3: Sizes of Cubes – in the works test with the approval of the Engineer incharge 10cm cub as may be used in place of 15cm provided 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 size is required to be tested the size of cubes should specified by the Engineer incharge keeping in view that generally the length of size of the cube should be about four times the maximum nominal size of aggregate in the concrete constituting the cube specimen.

Note 4: Strengthening Rotation to size of cube

Where 10cm cubes are used the values obtained from tests, of 10cm s cubes shall be reduced to the extent established by comparative preliminary tests with 10& 15cm. cubes or in the absence of such compressive test, by 10 percent of the value of determined from the tests in order to give the equivalent strength for 15cm., where cubes larger than 15cm are adepcted generally modification is necessary unless otherwise specified by the engineer incharge.

Note 5: Cylinder strength:

Compressive strength tests may with approval of the engineer incharge be conducted on 15cm diameter and 30cm., high cylinders in accordance with IS-516-1959 instead of a cube, where cylinder strength figures are adopted the compressive strength figures given above shall be modified according to the formula, minimum cylinder compressive strength required 0.8 compressive strength specified 15cm cubes.

The central Road Research institute, New Delhi has carried out tests with a view to establishing a relation between water cement ratio and the compressive strength concrete using ordinary Portland cements manufactured in the country in accordance with IS 269-1959.

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 cement tested in accordance with IS-269-1959. These graphs have been given in appendix as they would be of some assistance in obtaining the water cement ratio for trial mixes of concrete.

Table II : Optional work Test Requirement of Concrete:

(Clause 4.2.2.2 (a):

(All values in kg/cm².)

All test shall be conducted in accordance with IS : 516 – 1959

Grade of concrete	Compressive strength on 15cm cube min. at 7day	Modulus of rupture by beams test	
		At 72+2 Hours	At 7 Days
M.100	70	12	17
M.150	100	15	21
M.200	135	17	24
M.250	170	19	27
M.300	200	21	30
M.350	235	23	32
M.400	270	25	34

Note : Note 2 and 3 under tables I are also applicable to Table II

Table III:
CONCRETE MIX PROPORTIONS
(Clause 4-3-5)
ORDINARY CONCRETE

Grade of concrete	Total quantity of dry aggregate by volume per 50 kg of cement to be taken at the sum of the individual volume of fine and course aggregate mix	Proportion of fine aggregate to course aggregate	Quantity of water per 50 kg of cement mix
1	2	3	4
M.100	300	Generally 1:2 for fine aggregate to course aggregate by volume but subject to upper limit of 1:1 ½ and a lower limit of 1:3	34
M.150	220	-do-	32
M.200	160	-do-	30
M.250	100	-do-	27

Note 1: The proportion of the aggregate should be adjusted from upper limit of lower limit progressively as the grading of the fine aggregate become fine and the maximum size of course aggregate become larger.

Examples: For an average grading of fine aggregate that is zone II. I.S. 383/1963 the proportion shall be 1:1½ , 1:2 and 1:3 for maximum size of aggregate 10mm, 20mm and 40mm respectively.

Note 2: It may be noted for general guidance that M.100, M.150, M.200 and M. 250 of ordinary concrete corresponding approximately to 1:3:6, 1:2:4, 1:1½ :3 and 1:1:2 nominal mixes of ordinary concrete currently used in the country.

Table IV: Surface with water carried by average aggregate :

Aggregate	Approximate quantity of surface water (M3)
(1)	(2)
Very wet sand	120
Moderately by wet sand	60
Moist sand	40
*Moist gravel or crushed rock	20 to 40

*Coarser the aggregate less the water it will carry.

PERCENTAGE TENDER SYSTEM

Name of Work :-

I / We _____

S/o. _____

resident at _____

offer to executive the above work with tender premium of (+) plus _____

_____ (in words) / Minus (-) _____

_____ (in words) _____

Percentage over departmental estimated value of work indicated above. In case of variation in Quantity of various items of work during execution. I / We agree that the amount payable for individual items will be as per the departmental unit rates indicated in the tender schedule for the item as varied in accordance with the tender premium and actual quantity of work done.

Date :

Signature of Tenderer

Place :

Contractor

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Table IV: Preliminary Test :

WORK TEST**ACCEPTANCE CRITERIA FOR CONCRETE (ALL GRADE)**

Minimum No. of specimens from each batch (cubes)		Minimum Frequency	Criteria for acceptance	Minimum No. of specimens taken from the same days work				Minimum Frequency		Criteria for acceptance
7days compressive strength test as optional test if desired	28 days compressive strength test			Cubes		Beams		In terms of the quality 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 for if average compressive strength of the specimen tested is not less than the compressive strength specified in Table –I (For Optional tests See Table-2) subject to the condition that only one out of five consecutive test may give a value less than specified strength	3	3	3	3	For every 150 cubic metre of concrete or part thereof	At such intervals as the Engineer incharge, may decide. However in the case of concrete sample shall be drawn on each day for the first four day of concreting and there after atleast.	Accepted to average strength of the specimen test is not less than the strength specified Table –I (For optional test see Table-2) subject to the condition that only one out of three consecutive test may give a value less than the specified.

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1	2	3	4	5	6	7	8	9	10	11
---	10	For each batch with a minimum of three batches	Accept if average compressive strength of the specimens tested is not less than the compressive strength specified in Table-I subject to the condition that the average compressive strength shall be more than the specified compressive strength in Table-I, by atleast the value of standard deviation* of the series of the test * Standard deviation	5	5	5	5	For every 150 cubic metre of concrete or part thereof	Once in 7 days of concreting At such intervals as the Engineer incharge may decided. However in the case of controlled concrete samples shall be drawn on each day for the first four days of the concreting and there after atleast one seven days concreting	Strength but this shall not be less than 90% for the specified strength Accept if average strength of the specimen tested is not less than strength specified in Table-I (For optional tests see Table-32) subject to the condition the one out of five consecutive tests may give a value less than the specified strength.
* standard deviation = $d^2/(n-1)$ Where 'd' individual deviation from the average and 'n' number of specimens tested										

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