SCHEDULE - C

	Value of Contract	***Category***
1.	Rs 1.00 Lakh and upto 5.00 Lakhs	One diploma holder in Civil Engineering (or)
		Not less than one retired Junior Engineer
2.	Above Rs.5.00 Lakhs and upto 10.00 Lakhs	One B.E (Civil) holder (or) equivalent Degree holder (or) Not less than one Retired Sub-divisional Officer (or) Assistant Executive Engineer.
		One diploma holder with three years experience
3.	Above Rs.10.00 Lakhs and upto 25.00 Lakhs	i. One B.E (Civil) with three years experience plus one Diploma holder in Civil Engineering (or)
		ii. Equivalent Degree holder with 3 years experience plus one diploma holder in Civil Engineering (or)
		iii. Not less than one retired Sub-Divisional Officer plus one Diploma holder in Civil Engineering.
		iv. Two Diploma holders in Civil Engineering with 3 to 5 years experience respectively.
4.	Above Rs.25.00 Lakhs and upto 50.00 Lakhs	i. One B.E (Civil) with three years experience plus two Diploma holder in Civil Engineering (or)
		ii. One B.E (Civil) with three years experience plus two retired Junior Engineers (or)
		iii. Equivalent Degree holder with 3 years experience plus two diploma holder in Civil Engineering/ two retired Junior Engineers (or)
		iv. One retired Sub-Divisional Officer (Assistant Executive Engineer/Assistant Divisional Engineer) plus two retired Junior Engineers (or).
		v. One retired Sub-Divisional Officer (Assistant Executive Engineer/Assistant Divisional Officer) Plus two retired Junior Engineers.

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Contractor

Executive Engineer, PWD.,
Technical Education Division, Vellore-2

1. A Penalty of Rs.2000/- per month, for diploma holder and Rs.5000/- per month for degree holder, be levied in case of default on the part of contractors in following the norms laid down above.
2. In case the Contractor who is professionally qualified is not in a position to remain always at the site of work and to pay extra attention to such work, as many demand special attention (e.g. R.C..Works etc.,) he should employ technically qualified man as prescribed above.
3. The employment of technical assistants could be based only on the value of contract. Engineers with Mechanical Engineering qualification and retired from Civil Engineering Department are also suitable to supervise the Civil Engineering works because of their experience in Civil Engineering field.
4. It will not be incumbent on the art of the contractor to employ technical assistant/Assistants when the work is kept in omitted one to valid reasons and if in the opinion of the Executive Engineer, the employment or Technical assistant /Assistant is not required for the due fulfilment.
5. I/We will employ the following technical staff for supervising the work and will see that one of them is also at site during working hours personally checking all items of working and paying extra attention to sub work as required special attention (e.g) reinforced concrete works.

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6. Name of Technical staff

   Proposed to be employed Qualification

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

   Additional specifications, if any, which have to entered in schedule 'C' should be entered below the 1d (1) above and numbered continuously.

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Contractor

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Technical Education Division, Vellore-2

Clause 69-1 General conditions of contractors.

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 of as to any other matter or thing arising there under except as to the matters left to the sole discretion of the Executive Engineer under clause 18,20,25-3,27-1, 34, 35 and 37 of the General conditions of contract as to the with-holding by the Executive Engineer of the payment of any bill to which the contractor may claim to be entitled, then either party shall forth with give to the other, notice or such dispute of difference and such dispute or difference shall be and is hereby referred to the arbitration of the Executive Engineer of the Nominated Division, mentioned in the Articles of Agreements **(Executive Engineer, PWD., Technical Education Division, Vellore.-2** (hereinafter called the arbitrator) in cases where the value of claims is less than or upto Rs.10,000/- and of the Superintending Engineer, PWD., Territorial Circle. [here in after called the arbitrator in cases] where the value of claim in less than and upto Rs.50,000/-

Clause 69-2 "In cases where the value of claim is more than Rs.50,000/- the parties will seek remedy through the competent Civil Court.

4(a) If, at any time subsequent to the execution of this agreement, Government materials, other than those specified in the agreement are supplied to be contractor for use on the work they will be charged at the most value prevailing plus sales tax at the time of supply of wood in which rate including sales tax which is higher. The contractor will be informed in writing the rate which he demands for finishing the work in view of the fact that be into use Government material. No cartage confidential charges will be borne by Government in connection with the supply of the materials referred to in this paragraph.

CONDITION ON ENGAGING CHILD LABOUR

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

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Contractor

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Technical Education Division, Vellore-2

SCHEDULE – D

IMPORTANT CONDITIONS

1. Revenue recovery act

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

2. Special condition for Sales Tax

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

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

The actual weight of the steel used of reinforcement will be found out by the actual average weight of the sections used for the purpose, the out but random samples should be weighed for set, or grill measurement and average section weight recorded. Those should be go check measured by the Asst. Exe. Engineer incharge of the work payment for fabrication of reinforcement grills will be based on that section weight ascertained and recorded in the M. Book.

Sub-Clause 26(I) (A) : 26a (A) : The shrinkage period of six months referred to in main clause 26(1) above will be five years in respect of all contracts for construction of original buildings either semi-permanent or permanent to ensure structural stability of the building.

Sub-Clause 64(1) (A) : 64, 1 (A) Not withstanding the above clause, the with held amount of 21/2% from the final bill in respect of contract for construction of original building will be retained by the Government for a total period of one year lieu of six months period referred to in clause 64(1) and will be released after the expiry of one year period on execution of an indemnity bond by the contractor to the satisfaction of the Executive Engineer for further period of four years to ensures structure stability of the building under clause 26 (1) (A).

4. Water supply and lighting

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

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Executive Engineer, PWD.,
Technical Education Division, Vellore-2

CEMENT AND STEEL SUPPLY BY CONTRACTOR (SPECIAL CONDITION)

1. The Contractor shall procure and use Cement and Steel required for this work.
2. Cement to be used in the work shall conform to IS 269 only.
3. Mild Steel and cold twisted deformed bars to be used on the work shall conform to IS 1139. Steel Rerolled from Scrap will not be permitted on any account.
4. Cement and Steel to be used on the work shall be got approved by the Executive Engineer before use on the work. Necessary test certificate has to be produced at the time of supply.
5. Before procuring cement and steel from the market the contractors should test the same in Government Testing Laboratories contractors at their own cost should got the materials test in the Government approved laboratories and should produce the test certificate to the field engineers. The samples should be checked at PWD laboratories at various stages whether the materials supplied by the contractor, are standard ones or it should be got tested in Government approved Laboratories.

FOR CONTRACTORS SPECIAL ATTENTION

1. Clean river sand /Crushed Stone sand (M.sand) ,Plastering Sand (P.sand) shall be used on all cases.

2. Only clean fresh water should be used on the work. The special attention of the contractor is drawn to clause 36-1 of Preliminary Specification of the TNBP regarding water and lighting.

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

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

5. The iron hold fasts shall be built up in walls in cement mortar 1:3 at the time of construction of walls, No extra claim shall be due for the same wherever hold fasts are to provided to 9" thick walls, Those should be fixed with cement concrete 1:3:6 using 20mm gauge broken granite stone jelly for proper anchorage and proper binding. No separate rate for such pockets of concrete filling at holdfast points will be allowed and this will be measured as masonry along with adjacent masonry.

6. The teakwood shall be of best Indian teakwood only and shall subject to inspection and approval by the Executive Engineer before use on the work. Country wood where specified shall be Karimarudu or Kongu for scantling and Aiyini for planks.

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

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Contractor

Executive Engineer, PWD.,
Technical Education Division, Vellore-2

8. The work will be carried out with the least hindrance to the adjoining building and the contractor will be responsible for any damages, caused to the existing fixtures electric fittings etc., in the course of execution and the contractor shall made good any damage without any claim for extra.
9. In the case of 'T' beams and Ell beams, the quantity give in the schedule is the quantity of rib portion only. The top flange portion will be always measured with the general slab portion and paid for at the slab rate only. For all RCC works the rate shall include the treatment of bearing as per plate No.2 of 1946 as per TNDSS (Page 3 of 1964 Edition)
10. Concrete works : All exposed concrete surface will be required to be finished by cement plaster as detailed in Schedule 'A'.
11. Plastering : All external corners, edges of beams, edges of doors and window opening etc., shall be finished sharp using richer mortar and also finished truly vertical or horizontal as the case may be. The rate for plastering shall include the cost finishing as above and not separate extra for the corners, edges, beams etc., shall be paid.
12. If rates are not separately called for, for similar items of works in different floors, the contractor should note that one rate is applicable for all floors indicated in the detailed plans. Any claim for extra for such items floor war will not be entertained under any circumstances.
13. The Superintending Engineer reserve the right to split up the work and entrust the main work, internal water supply and sanitary arrangement to contractors without assigning any reason therefore.
14. The projection if any to the masonry will be measured under the relevant items and not extra will be paid for finished the same.
15. The work should be executed in accordance with the circular instruction of the Chief Engineer (Building) issued from time to time copy of the circular instruction can pursued in Division office during office hours.

ADDITIONAL SPECIFICATION

1. The arrangement of M.S rods for all RCC works shall be in accordance with the working drawing supplied.
2. (i) The planks for forms and centering for RCC works shall be of well seasoned timber approved by the Executive Engineer according the clause 10 of TNDSS No.30. They must be made smooth and perfectly level at top so as to give smooth and even finish to the RC ceilings. Alternatively, the contractor may use steel sheets over wooden forms provided the required finish to the underside of the slab is obtained. Mango planks shall not be used under any circumstances. Centering and form work shall be provided to the extent and area ordered by the Executive Engineer during execution.
   (ii) Payments for centering works for all RCC items shall be made only after the concrete is laid, even though separate items for centering works area included in the schedule.
   (iii) All cement concrete for RC works shall be machine mixed and vibrated.
   (iv) All lime mortar shall be ground in mortar well as per TNDSS.

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Contractor

Executive Engineer, PWD.,
Technical Education Division, Vellore-2

ADDITIONAL CONDITION – I

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

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

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

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

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

   If the material were originally used by the department the price allowed to the contractor on re-acquisition shall not exceed the amount charged to the contractor excluding the elements of storage charges if any.

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

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

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

8. 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. Ex-today tappers and unemployed agricultural labourers as far as possible.

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Contractor

Executive Engineer, PWD.,
Technical Education Division, Vellore-2

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

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

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

12. The contractor shall abide the contractors labour regulations of the PW framed by the Tamilnadu Government.

ADDITIONAL CONDITIONS OF CONTRACT II

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-in-charge and on his failure to do so, the Government shall be entitled to provide same and recover the cost from the contractor.
2. When there are complaint 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 arrangement for workers employed by the PWD and its contractors.

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

First Aid

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

Drinking Water

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

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

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

   The Contractor should use steel centering sheets over sites as to obtain the required finish to the under site of the slab centering steel sheets must be made smooth and perfectly level and to give smooth and even finish to the RCC ceiling centering and form

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Contractor

Executive Engineer, PWD.,
Technical Education Division, Vellore-2

work shall be provided to the and area ordered by the Executive Engineer during execution.

(d) the 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 a month.

Washing and Bathing Places

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

Latrines and Urinals

4. There shall be provided within the premised, of every work place latrines and urinals in an accessible place and the accommodations separately for each of them shall be on the following scale or on the scale so directed by the Executive Engineer in any particular case.
   (i) Where the number of persons employed does not exceed 50 - 2 seats
   (ii) Where the number of persons employed exceed 50 but not exceed 100 – 3 seats
   (iii) For every additional 100 persons - 3 seats

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

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

Shelter During Rest

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

Crèches

6. At every work place at which 25 or more women are working there shall be provided two huts of suitable size for the use of children under the age of 6 years belonging to such women. One hut shall be used for infants, Games and Play and the other as their bedroom.

The huts shall not be constructed on lower standard than the following

(i) Thatched roofs.
(ii) Mud floors and walls.
(iii) Planks spread over the mud floor and covered with matting.

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Contractor

Executive Engineer, PWD.,
Technical Education Division, Vellore-2

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

The number of the huts shall be restricted to children, their attendants and attendants of the children.

Canteen

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

Sheds for Workmen

8. The contractor should provide at his own expense shed for housing the workmen. The shed shall be on a standard not less than the cheap shelter type to live in which the work pertaining to locality are accustomed to. A floor area of about 1.8m – 1.5m for 2 persons shall be provided. The sheds are to be row with 1.5m clear space between sheds and 24m clear space between row if conditions permit. The work people's camp shall be laid out in units of 400 persons each. Each unit to have clear space of 14.1m around.

ADDITIONAL CONDITION IV

Safety provision in the building industry – conditions in addition to clause 36 of Preliminary specification TNDSS.

PART I

ARTICLE I

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

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Executive Engineer, PWD.,
Technical Education Division, Vellore-2

ARTICLE – 2

1. Working platforms, gangways and staircase shall be so constructed that no part thereof sag unduly or unequally.

(a) Be so constructed and maintained to obviate from risks of person tripping or slipping and

(b) Be kept free from any unnecessary obstruction.

(c) Every working platform gangway working place and staircase shall be suitable forced.

ARTICLE 3

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

ARTICLES 4

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

PART III

GENERAL RULES AS TO HOISTING APPLIANCES

ARTICLE 5

1. Hoisting machines and tackle including their attachments en hostages and supports shall

(a) Be of good mechanical constructions sound material and adequate strength and free from patent defect and

(b) Be kept in good hoisting or lowering materials or as a means of suspension shall be of suitable quality and adequate strength and free patent strength.

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Executive Engineer, PWD.,
Technical Education Division, Vellore-2

ARTICLE 6

Hoisting machines and tackle shall be examined and adequately tested after erection on the site and before use and be re-examined in position at intervals to be prescribed by national law or regulation.

Every chain ring, hook shackle, swivel and pully block used in hoisting or lowering materials or as a means of suspension shall be periodically examined.

ARTICLE 7

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

ARTICLE 8

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

ARTICLE 9

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

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Technical Education Division, Vellore-2

PART III

GENERAL RULES TO SAFETY EQUIPMENT AND FIRST AID

ARTICLE 10

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

ARTICLE 11

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

ARTICLE 12

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

ARTICLE 13

Where large work places are situated in cities, towns or in their suburban and not beds are considered necessary owing to the proximity of city or town hospital, suitable transport shall be provided to facilities removal of urgent cases to the hospitals, at their work places, some conveyance facilities such as car shall be kept readily available to the injured person or persons suddenly taken seriously ill to the nearest hospital.

MOSIAC FLOORING

1. Cement concrete flooring tiles shall be manufactured from a mixed cement natural aggregates and colour materials where required by pressure process. During manufacture, the tiles shall be subjected to a pressure of not less than 140 kg per sqm (or 2000 lbs.sq.inch).

2. Proportion of cement to aggregate in backing of the tiles shall be not less than 1:5 by weight.

3. On removal from mould, the tile shall be kept in moist condition continuously for at least 7 days and subsequently if necessary kept moist for such a longer period that would ensure their conformity, to the requirements of Transverse, strength, Resistance to wear and tear absorption and would minimize shrinkage and cracking, titles shall be stored under cover.

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

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Contractor

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Technical Education Division, Vellore-2

THICKNESS OF WEARING LAYERS

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

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

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

GENERAL QUALITY OF TILES

7. Unless other wise required the wearing face of terrace tiles shall be mechanically sound and flat. The wearing face of the tiles shall be plane free from projections depressions and crack (Hire cracks not included) and shall be reasonably parallel to the back face of tiles. All angel shall be right angles and all edges shall be sharp and true.

8. Breaking Transverse strength of tiles shall be given as below:

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

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Executive Engineer, PWD.,
Technical Education Division, Vellore-2

9. The average wear of not less than 12 specimens shall not exceed 2mm and the wear on any individual specimen shall not exceed 2.5cm when tested in an Abrasion Machine.
10. The average percentage of water absorption shall not be less six full tiles shall be exceed ten in the case of water absorption test.

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

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

    The dadoing and skirting have to be finished b y giving necessary recess in the brick wall itself so that projections does not exceed ¾" for the face of the wall i.e the finished plastered surface.

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

GUIDELINES FOR ADOPTION OF STRENGTH GRADENNING OF CONCRETE

Plain and reinforced concrete have been graded according to the cube compressive strength and designated as M100, M150, M200, M300, M 350 and M400. In the designation of concrete the letter "M" refers to the mix and "Number" to the specified 28 day work cube compressive strength of that mix expressed in kg.cm2.

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

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

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Contractor

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Technical Education Division, Vellore-2

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

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

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

PROPORTIONING OF MIX

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

MIXING

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

TESTS

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

(A) Preliminary Test

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

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

Designing a concrete mix before the actual concrete operation starts.

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Technical Education Division, Vellore-2

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

(b) Verifying the strength of cement mix.

(B) Works Test

The test shall be conducted either in the field or in laboratory on the sample made on the workshop of the concrete used on the works.

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

All the expenses on the tests shall in the presence of the Assistant Engineer concerned and the contractor or his authorized agent.

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

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

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

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EXTRACT
NATIONAL BUILDING CODE OF INDIA 1970
PART VI – SECTION 5A : PLAIN AND REINFORCED CONCRETE

4.2 Grades of concrete.

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

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

4.2.2.1 Where ordinary Portland cement or Portland blast furnace slag cement conforming to accepted standards VI-5(2)* is used the compressive strength requirements for various grades of concrete shall be given in TABLE 1. Where rapid hardening Portland Cement is used, the 28 days compressive strength requirements specified in table. I shall be met at 7 days. Where other cements are used, the Engineer-in-Charge shall specify the corresponding requirements preferably on the basis of preliminary tests.

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

IS 455/167 – Specification for Portland and blast furnace slag cement.

4.2.2.2 The strength requirements specified in Table 1 shall apply to both controlled concrete and ordinary concrete (See 4.3.1) Preliminary tests need not, however, be made in the case or ordinary concrete.

(a) In order to get a relatively quickly idea of the quality of concrete, optional works tests on beams for modulus of rupture at 72+2 hours or at 7 days, or compressive strength tests at 7 days may be carried out in addition to 28 day compressive strength test in all cases the 28 day compressive strength specified in Table 1, shall alone be the criterion for acceptance or refection of the concrete. If however from tests carried out in a particular job over a reasonably long period. It has been established to the satisfaction of the Engineer-in-Charge that a suitable ratio between the 28 days compressive strength and the Modulus of rupture at 72+2 hours or at 7 days or compressive strength at 7 days may be accepted. The Engineer in charge may suitably relax the frequency of 28 day compressive strength test specified in Table 5 provided the expected strength values at the specified early age are consistently met. For this purpose the value given in table 2 may be taken for general guidance in the case of concrete made ordinary cement.

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

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5.3 PROPORTIONING AND WORKS CONTROL

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

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

(b) Without preliminary tests by adopting nominal concrete mix. Such concrete shall be "Ordinary concrete".

4.3.2. CONTROLLED CONCRETE

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

4.3.2.2. The concrete mix shall be designed to have an average strength corresponding to the values specified for preliminary test in Table 1. The proportion chosen should be such that concrete is of adequate workability for the conditions prevailing on the work in question, and may be properly compacted with the means available.

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

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

4.3.2.4. In proportioning concrete, the quantity of both cement and aggregate should be determined by weight, where the weight of cement is determined by accepting manufacture's weight per bag, a reasonable number of bags should be weighed separately from the aggregates. Water should be either measured by volume in calibrated tanks or weighed. All measuring conditions, and their accuracy may be periodically checked.

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

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Technical Education Division, Vellore-2

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

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

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

4.3.3. **ORDINARY CONCRETE**:

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

4.3.3.2. In proportioning concrete, the quantity of cement should be determined by weight. The quantities of fine and coarse aggregates may be determined by volume but these should also preferably by determined by weight. In the latte case, the weight should be determined from the volume specified in table 3 and the weight per liter of dry aggregate. If fine aggregate, is moist and volume batching is adopting, allowance shall be made for bulking in accordance with good practice [vi-5(9)]*

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

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

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

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

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

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

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

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

5.4 Samples size and acceptance criteria.

4.4.1. All tests shall be carried out in accordance with good practice (VI-5(4)+

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

+ISI 199 -1959—Methods of sampling, and analysis of concrete.

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

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

TABLE

STRENGTH REQUIREMENTS OF CONCRETE

(Clauses 4.2.2.1 and 4.2.2.2)

(All values in kg/cm2)

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

Grade of concrete (1)	Preliminary Test Min (2)	Works Test Min (3)
M 100	135	100
M150	200	150
M200	260	200
M250	320	250
M300	380	300
M350	440	350
M400	500	400

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

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Technical Education Division, Vellore-2

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

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

(c) Verifying the strength of concrete mix.

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

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

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

+IS 516 – 1959 – Methods of test for strength of concrete.

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

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

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

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TABLE 2

OPTIONAL WORKS TEST REQUIREMENTS OF CONCRETE

Clause 4.2.2.2. (a)

(All values in Kg/cm2)

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

Grade of concrete (1)	Compressive Strength on 15cm cubes Min. at 7 days (2)	Modulus of Rupture by Beams test	
		At 72+2 Hours (3)	At 7 days (4)
M100	70	12	17
M150	100	15	21
M200	135	17	24
M250	170	19	27
M300	200	21	30
M350	235	23	32
M400	270	25	34

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

TABLE 3

CONCRETE MIX PROPORTIONS

(Clause 4.36.3.)

Ordinary concrete

Grade of concrete (1)	Total quantity of dry Aggregates by volume Per 50 kg. of cement To be taken as the sum of the Individual Volumes of fine and coarse Aggregates Max. (2)	Proportion of fine aggregate to coarse aggregate (3)	Quantity of water per 50 kg of cement Max (4)
	Litres		Litres
M100	300	Generally 1:2 for fine Aggregate to course aggregate By volume but subject to an	34
M150	200	Upper limit 1:1 ½ Lower limit of 1:3	32
M200	160	_____	30
M250	100	_____	27

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Note : It may be noted for general guidance that M100, M150, M200 and M250 of ordinary concrete correspond approximately to 1:3:6, 1:2:4, 1:1 ½:3 and 1:1:2 nominal mixes of ordinary concrete currently used in the country.

* The proportions of the aggregates should be adjusted from upper limit to lower limit progressively as the grading of the fine aggregates becomes finer and the maximum size of coarse aggregate becomes larger. Example for an average grading of fine aggregate that is, zone II in accordance with good practice [VI-5(!)]+ the proportion shall be 1:1 ½, 1:2 and 1:3, for maximum size of aggregate 10mm, 20mm and 40mm respectively.

TABLE 4

SURFACE WATER CARRIED BY AVERAGE AGGREGATE

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

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

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

IS 516-1956 Specification for natural and manufactured aggregates for use in mass concrete.

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ACCEPTANCE CRITERIA FOR CONCRETE (ALLL GRADES)

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

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Technical Education Division, Vellore-2

(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 compressive that the strength specified in Table 1 subject to the condition that the average compressive strength shall be more than the specified compressive strength is Table 1 by at least the value of Standard deviation* of the series of test	5	5	5	5	For every 150m of concrete of part thereof	At such internals as the Engineer in-charge may decide However, in the case of controlled concrete, samples shall be drawn on each day for the first 4 days of converting and there after atleast once in 7 days concreting	Accept if average strength of the specimens tested is not less than the strength specified in table 1 (for option tests see table 2) subject to the condition that only one out of 5 consecutive tests may give a value less than specified strength.

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

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

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GENERAL SPECIAL CONDITIONS

1. The entire work should be carried out as per specifications of the Tamilnadu Building Practice and the additional specifications enumerated, as from time to time.
2. The rates specified in the schedule for the different item of work are for the finished work.
3. The shed for storing materials should be put up by the contractor at his, own cost.
4. The contractor should satisfy himself about the availability of the various materials at the quarries before tendering for the work.
5. The Executive Engineer will be at liberty to carry out any portion of the work at any time either departmentally or through other agency in the interest of Government work without assigning any reason to the contractor who is actually doing the work. The contractor is not entitled for any compensation on account of the same. The contract will be only subject to this condition.
6. The contractor has to make his own arrangements for procuring water for construction purpose, Construction and curing should be done with water free from injurious amounts of deterious materials, portable water are generally considered, satisfactory for curing and fixing concrete and masonry. However the water tube used should be periodically tested at contractors cost for its suitability for using in the construction work and got approved from Department Engineers.
7. The contractor shall be responsible for the payment of seigniorage charges to the forest Department and Revenue Department if the contractor quarries the materials from the above departmental lands.
8. The contractor shall be responsible for the payment of seigniorage charges to the concerned department of the Government if any demands received from other departments in this respect it will be recovered from the contractor's bills and remitted to the department concerned.
9. The contractor shall keep up the programme of execution as per the time schedule enclosed with the schedule failing which the penal clauses will apply.
10. Deductions in Income tax at the rate of 2% will be deducted at the time of payments on the total value of work done including cost of materials supplied departmentally if the cumulative value of work done exceeds Rs.5000/-
11. In the event of the work being transferred to any other Circle/Division/Sub Division the Superintending Engineer/Executive Engineer/Assistant Executive Engineer have jurisdiction over the work shall be competent to exercise all the powers and privileges reserved in favour of the Government.
12. If night work is required to fulfill the agreed rate of progress the contractor including lighting without any claim for extra rate shall make all arrangements.
13. The contractor shall not employ the labour below the age of 12 years.

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14. Payment will be made on detailed measurements. If any of the item in the schedules be omitted or quantity radically altered, no variations in the rate shall become payable to the contractor on account of such omission or variations in quantities.
15. The contractor shall take all precautionary arrangements to avert any Accidents, the Contractor will be fully responsible for any accident occurred during execution of work for labour, materials and machinery etc.,

    The contractor shall execute the various items of works as per approximate quantities of work given in the schedule- A and as per the General conditions to the contract of TNBP clause, regarding "Alterations and additions". The contractor shall have no claim if any part of work is deviated. The contractor shall execute additional quantity of work of 25% of each item at the agreement rates. For additional quantities above 25% the contractor should take specific written orders of the Executive Engineer before executing additional quantities beyond 25%.
16. Any material proposed to be used on the work of which the detailed specification and quality are not given in the Tamilnadu Building Practice should have been certified by the ISI. All materials inferior in quantity and also not certified by the ISI if used on the work shall have moved and replaced with ISI certified materials at the cost of the contractor. The Executive Engineer's approval should be obtained before use on work for all the materials.
17. The contractor shall form his own approach track to the work site for which no extra rate will be paid to him. On completion of the work, the contractor shall not be permitted to remove the materials laid for formation of road. If the contractor is allowed to use the existing roads he shall maintain them in good condition at his own cost through out the period of contract.
18. The contractor shall abide by the contractor laborer regulation of the PWD framed by the Tamilnadu Government in respect of payment of wages Act, workmen compensation Act, Industrial dispute Act, Shops and Establishment Act and Factories Act wherever applicable.
19. Sufficient labourers as may be required by the Executive Engineer shall be employed at the work so as to achieve progress of work as will be determined by the Executive Engineer.
20. Additional items of work not contemplated in the tender schedule shall not be executed without the written orders of the Executive Engineer, Payment for such items of works will be made only after the rates are settled in advance and accepted by the competent authority.
21. The work shall be carried out with the least hindrance to the adjoining buildings and the contractor will be responsible for any damages caused to the existing structures, fixtures fittings etc., in the course of execution and the contractor shall make good any such damages without any claims for extra.
22. The contractor should use steel centering as per specification and the required finish to the exposed surface of R.C. works is to be obtained.

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Payments and certificates

Clause 64.1 Payments will be made to the contractor under the certificates to he issued at reasonably frequent intervals by the Executive Engineer or the Sub-Divisional Officer, within 14 days of the date of each certificate an intermediate payment will be made by the Executive Engineer or the Sub-Divisional Officer of a sum equal to 95 percent of the value of work as so certified and the balance of 5% will be withheld and retained as security for the due fulfillment of the contract.

Under the certificate to be issued by the Executive Engineer or Sub-Divisional Officer on the completions of the entire works, the contractor will receive :he final payment of all the moneys due or payable to him under or by virtue of the contract except security deposit and the with held amount equal to 2 1/2 percent of the total value of the work done provided there is no recovery from or forfeiture by the contractor to be made under clause 57. The amount withheld from the final bill will be retained under. "Deposits" and paid to the contractor together with the Security Deposit after six months reckoned from the date of completion of work or as soon after the expiration of such period of six months as all defects shall have been made good according to the true - intent and meaning thereof whichever shall last happen, in the event the final bill remains unpaid even after the period of One year before said, the Executive Engineer shall refund the security deposit which includes the E.M.D. and also the withheld amount on a separate bill if requested or by the contractor in .writing. No certificate of Executive Engineer or Sub Divisional Officer shall be considered conclusive evidence as to the sufficiency of any work or materials or correctness of measurements to which is related nor shall it relieve the contractor from his liability to make good defects as provided by the contract. The contractor when applying for a certificate, shall prepare a sufficiently detailed bill based on the original figures of quantities and rates in the contract scheduled to the satisfaction of the Executive Engineer, to enable the Executive Engineer or Sub-Divisional Officer to check the claims and issue the certificate. The certificate as to such of the claim mentioned in the application as are allowed by the Executive Engineer or the Sub-Divisional. Officer shall be issued within fourteen days of the application. No application for a certificate shall be made within fourteen days of a previous application.

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ADDITIONAL CONDITIONS TO THE TENDERERS

1. The tenderer should work out his rates without reference being made to the schedules.
2. The Tenderer/contractor shall note that the individual school/toilet buildings situated at various places. If any change in site, change in Horizontal or vertical orientation of an individual building will be found necessary during execution by the departmental officers, the contractor shall bound to accept and execute the work with allow able quantities of work as directed by the departmental officers.

SPEICAL CONDITIONS FOR RECOVERY OF SALES TAX

The tenderers should be required to indicate their registration number under the Tamilnadu General Sales Tax Act 1956 in the tender form and produce sales Tax Clearance certificate issued by the commercial Tax Department before final settlement of bills.

According to the notification issued by the Commissioner of Sales Tax Chennai with regard to "Deduction of Sales Tax at source in respect of works contractor in the TAMIL NADU GOVERNMENT GAZETTE CHENNAI dated 31.5.1999, a new provision under 7F for deduction of tax sources is introduced in the Tamilnadu General Sales Tax Act 15 of 1999 with effect from 10.6.1999. as per this new section , 7F of this act, at the time of payment of such sum deduction at 2% (Two percent) in respect of civil works and 4% (Four percent) in respect of all other works contract from the total amount payable to the contractor and the amount so deducted shall be deposited to the assessing officer concerned with in "SEVEN" days.

Add New Conditions for Goods and Services Tax (GST)

And the GST amount will be calculated at 12% from the sum of total tendered value quoted by the tenderer for construction cost (excluding GST) specified in the BOQ, Subject to GST rate applicable from time to time as recommended by the GST Council "All duties, taxes, and other levies except GST, payable by the contractor under the contract, or for any other cause shall be included in the rates, prices and total Bid Price submitted by the Bidder"

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SPECIFICATION FOR SANITARY, DRAINAGE AND WATER SUPPLY ARRANGEMENTS

1. Water closets, basins, urinals, sinks and other sanitary were shall be approved Indian make as required in the relevant items. The fixing of these shall be in accordance with the special specification attached.
2. The rates shall include all dismantling, making holes in walls or slabs, and restoring the structure to the original condition after the completions of the work.
3. The work shall be carried out with least hindrance to the adjoining buildings and the contractor shall be responsible for any damage caused to the existing fixtures, electric fitting etc., in the course of execution and the contractor shall make good such damage without claim for extra.
4. The rates for laying stoneware pipes shall include necessary earth work excavation for trenches (Irrespective of nature of soil and depth) and all incidental charges such as shoring, strutting and bailing out water, refilling trenches after the completion of work and consolidating, removing the surplus earth to places shown within the compound and making good the damages to read and other structures.
5. The rates for laying G.I Pipes shall include earth work for trenching and refilling them and fixing with wooden plugs, clamps and screws where the pipes are fixed to walls. The rates for G.I pipe shall also include wrapping them with tarred tape where they are buried in earth tarring the portions embedded in masonry and painting with white paints two coats for port ions above ground level.
6. The clamps for G.I pipes, fitting should not be spaced more than 150mm apart. The wooden plugs for pipe and bracket fittings should be properly fixed in C.M 1:3 in holes made in masonry with the wide and wedge shaped plugs inside and not hammered with them and into walls. The size of plugs should not be less than “Squarrat” this end and 12mm at the other end with a depth of less than 75mm.
7. New sewer and drains should pass hydraulic test of not exceeding 3.60 meters, at the lowest end.
8. Where a new sewer line is connected to an existing manhole rates quoted shall include necessary excavation dismantling masonry refilling and redoing the disturbed portions as directed without claiming any extra for those.
9. (a) Paint with two coats of best white glazed paint or any other colour approved by the Executive Engineer over a priming coat of Red lead to all flushing tanks, Brackets, clamps used for fixing pipes and all lead connections.

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

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

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SUPPLYING AND FIXING INDIAN TYPE WATER CLOSETS

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

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

SUPPLYING AND FIXING EUROPEAN TYPE WATER CLOSETS

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

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

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Contractor

Executive Engineer, PWD.,
Technical Education Division, Vellore-2