3.1 SPECIFICATIONS

Specification is defined as the separate contract document, consisting ofinformation regarding the quality of materials and workmanship. The combinationof drawings and specifications will completely define the structure physically andtechnically.

Sometimes, it may be used to describe the contents, which could not beexplained clearly by drawings.

3.1.2 GENERAL SPECIFICATIONS

This gives the nature and class of the work and materials in general terms, to be used inthe various parts of work, from the foundation to the superstructure. It is a short description ofdifferent parts of work specifying materials, proportions, qualities, etc., General specificationsgive general idea of the whole work or structure and are useful for preparing for estimate

3.1.3 DETAILED SPECIFICATIONS

These gives the detailed description of the various items ofwork laying down the Quantities and qualities of materials, their proportions, the method ofpreparation workmanship and execution of work.

3.1.3.1 DETAILED SPECIFICATIONS OF EXCAVATIONS, FILLING AND BACKFILLING

Scope of Work

The scope for work covered under this specifications pertain to excavation offoundations, trenches, pits and over areas, in all sorts of soil, soft and hard rock, correct todimensions given in the drawing including shoring, protections of existing undergroundutilities of any, such as water lines, electric cables etc. dewatering and shoring if necessary,stacking the useful materials as directed within the lead specified, refilling around thefoundation and into the plinth with selected useful excavated earth

and disposing off thesurplus earth / materials within specified lead and finishing the surface to proper levels,slopes and camber etc. all complete.

Site Clearance:

Before the earth work is started the area coming under cutting and filling shall becleared of all obstruction, loose stones, shrubs, rank vegetation, grass, bushes and rubbishremoved up to a distance of 150 meters outside the periphery of the area under clearance.This work is deemed to be included in the earthwork item rate and no separate payment willbe admissible.

Roots and Vegetation clearance:

The roots of trees if any shall be removed to a minimum depth of 60 cm below ground level or a minimum of 30 cm below formation level whichever is lower and the hollows filled up with earth leveled and rammed. This work is deemed to be included in the earthwork items and no separate payment will be admissible for the work. Any material obtained from the site will be the property of the Government of India and the useful materials as decidedby the Engineer-in-charge will be conveyed and properly stacked as directed within the leadspecified.

Setting out and making profiles:

Masonry or concrete pillars will be erected at suitable points in the area to serve as benchmarks for the execution of the work. These benchmarks shall be connected with G.T.S.or any other permanent benchmark approved by the Engineer-in-charge. Necessary profileswith pegs, bamboos and strings or Burjis shall be made to show the correct formation levelsbefore the work is started. The contractor shall supply labour and materials for setting out andmaking profiles and Burjis for the work at his own cost and the same shall be maintainedduring the excavation work. The Department will show grid co-ordinate or other referencepoints. It shall bethe responsibility of the contractor to set out center lines correctly withreference to the drawings and install substantial reference marks. Checking of such alignmentby the Department will not absolve the contractor from his responsibility to execute the workstrictly in accordance with the drawings.

Excavation:

The contractor shall notify the Engineer-in-charge before starting excavation and

before the ground is disturbed, to enable him to take existing level for the purpose of measurements. The ground levels shall be taken at 5 to 15 metres intervals in uniformly sloping ground and at closer distance where local mounds, pits, or undulations are met with,as directed by the Engineer-in-charge. The ground levels shall be recorded in field books andplotted on plans, which shall be signed by the Contractor and the Engineer-in-charge, beforethe earthwork is actually started. The labour required for taking levels, shall be supplied bythe Contractor at his own cost. The Contractor shall perform excavation in all types of soils,Murom, soft and hard rock, boulders etc. in foundation, over areas and in trenches to widths,lines, levels, grades and curves as shown in the drawing or lesser widths, lines, levels, gradesand levels as directed by the Engineer-in-charge and per items in the schedule of quantities.The item in the schedule of quantities shall specify the excavation in trenches or over areas.For this purpose, the excavation for any depth in trenches for foundation not exceeding 1.5min width or 10sqm. on plan shall be described as excavation in foundation trenches.Excavation exceeding 1.5m in width as well as 10sqm. on plan (excluding trenches for pipes,cables etc.) and exceeding 30cm in depth shall be described as excavation over areas. Excavation exceeding 1.5m in width as well as 10sqm. on plan but not exceeding 30cm.
in depth shall be described as surface Excavation.

Classification of Earth work:

The earthwork shall be classified under the following main categories and measured separately for each category. All types of soil, murrum, boulders, Soft rock, Hard rock.

All types of Soils, Murrum, Boulders:

This includes earth, murrum, top deposits of agricultural soil, reclaimed soil, clay,sand or any combination thereof ad soft and hard murrum, shingle etc. which is loose enough to be removed with spadies, shovel and pick axes. Boulders not more than 0.03 cum. in volume found during the course of excavation shall also fall under this classification.

Excavation in Soft Rock:

This shall include all materials which are rock or hard conglomerate, all decomposedweathered rock, highly fissured rock, old masonry, boulders bigger than

0.03 cum, in volumebut not bigger than 0.5 cum. and other varieties of soft rock which can be removed only withpick axes, crow bars, wedges and hammers with some difficulty. The mere fact that thecontractor resorts to blasting and / or wedging and chiseling of reasons of his own, shall notmean the rock is classifiable as hard rock.

Excavation in Hard Rock :

This includes all rock other than soft rock mentioned in para above 1.5.1 (b) viz. softrock, occurring in masses, boulders having approximate volume more than 0.5 cum. plain orreinforced cement concrete, which can best be removed by chiseling and wedging whereblasting cannot be permitted owing to any restriction at site.

Excavation in Hard Rock by Chiseling and Wedging:

Where blasting is not permitted and if the Engineer-in-charge so desires, theexcavation shall be done by chiseling and wedging or any other agreed method.

Note: All the excavated hard rock obtained shall be stacked properly and neatly within the specified lead by the contractor as directed by the Engineer-in-charge

Excavation:

The excavation under all classifications in areas in trenches or in pits shall be carriedout systematically. Cutting shall be done from top to bottom and not under pining or undercutting will be allowed. The bottom and sides of excavation shall be dressed to proper level,slopes, steps, camber etc. by removing high spots and ramming thoroughly as directed by the Engineer in-charge. All the excavation shall be carried out strictly to the dimensions given inthe drawing. The width shall generally be of the width of mud mat concrete and depth asshown in drawing or as directed by the Engineer-in-charge, according to availability of thedesired bearing capacity of soil below. Any excavation if taken below the specified depthsand levels, the contractor shall at his own cost fill up such over cut to the specified level withcement concrete 1:4:8 in case of excavation in all types of soils an with cement concrete1:2:4 in case of excavation soft and hard rock. After the excavation is completed, thecontractor shall notify the Engineer-in-charge to that effect and no further work shall be takenup until the Engineer-in-charge has approved the depth and dimensions an also the nature offoundation materials, levels and measurements shall also be recorded prior to taking up anyfurther work.

Shoring:

Unless separately provided for in the schedule of quantities, the quoted rate forexcavation shall include excavation of slopes to prevent falling in soil by providing and / orfixing, maintaining and removing of shorting, bracing etc. The contractor would be

responsible for the design of shoring for proper retaining of sides of trenches, pits etc. withdue consideration to the traffic, superimposed loads etc. shoring shall be of sufficient strengthto resist the pressure and ensure safety from slips and to prevent damage to work andproperty and injury to persons. It shall be removed as directed after items for which It isrequired are completed should the slips occur, the slipped materials shall be removed andslope dressed to a modified stable slope. Removal of the slipped earth will not be measuredfor payment.

Dewatering:

Unless specifically provided for as a separate item in the schedule of quantities, rate shall alsoinclude bailing or pumping out all water which may accumulate in the excavation during theprogress of further works such as mud mat concrete, R.C. footings, shuttering etc. either dueto seepage, springs, rain or any other cause and diverting surface flow by bunds or othermeans. Care shall be taken to ensure that the water discharged sufficiently away from thefoundations keep it free from nuisance to other works in the neighborhood.

Disposal of Excavated Materials: Antiquities:

Any finds of archeological interest such as relics of antiquity, coins, fossils or otherarticles of value shall be delivered to the Engineer-in-charge and shall be the property of the Government.

Useful Materials:

Any material obtained from the excavation which in the opinion of the Engineer in chargeis useful, shall be stacked separately in regular stacks as directed by the Engineerin chargeand shall be the property of the Government. No material excavated fromfoundation trenches of whatever kind they may be are to be placed even temporarily nearerthan about 3m from the outer edge of excavation. Discretion of the Engineer-in-charge insuch cases is final. All materials excavated will remain the

property of the Department. Ratefor excavation includes sorting out of the useful materials and stacking them separately asdirected within the specific lead. Material suitable and useful for backfilling or there use shallbe stacked in convenient place but not in such a way as to obstruct free movement ofmaterials, workers and vehicles or encroach on the area required for constructional purposes.It shall be used to the extent required to completely backfill the structure to original groundlevel or other elevation shown on the plan or as directed by the Engineer-in-charge. Materialsnot useful in anyway shall be disposed off, leveled and compacted as directed by theEngineer-in-charge within a specified lead. The site shall be left clan of all debris and leveledon completion.

Backfilling in sides of Foundations, Plinth, Under Floor etc:

The backfilling shall be done after the concrete or masonry has fully set and shall bedone in such a way as not to cause under-thrust on any part of the structure. Where suitableexcavated material is to be used for backfilling, it shall be brought from the place where itwas temporarily deposited and shall be used in backfilling. The scope of work for backfilling/filling in foundation, plinth, under floors etc. shall include filling for all the buildings coveredunder the contract. Surplus earth available from one building, if required, shall be used forbackfilling filling for other buildings also within the specified lead mentioned in the item. Alltimber shoring and form work left in the trenches, pits, floors etc. shall be removed aftertheir necessity ceases and trash of any sort shall be cleared out from the excavation. All thespace between foundation masonry or concrete and the sides of excavation shall be backfilledto the original surface with approved materials in layers not exceeding 150mm, in thickness,watered and well consolidated by means of rammers to at least 90% of the consolidation.Areas inaccessible to mechanical equipment such as areas adjacent to walls and columns etc. shall be tamped by hand rammer or by hand held power rammers to the required density. The backfill shall be uniform in character and free from large lumps, stones. shingle or bouldernot larger than 75mm. in any direction, salt, clods, organic or other foreign materials whichmight rot. The backfilling in plinth and under floor shall be well consolidated by means ofmechanical or hand operated rammers as specified to achieve the required density. Test toestablish proper consolidation as required will be carried

out by the Department at ratesspecified. Two tests per 50 sqm. will be taken to ascertain the proper consolidation. The costof tests carried out will be recovered from the contractor's bill.

Filling in Plinth and Under Floors:

After the available suitable excavated materials are exhausted as backfilling, thecontractor shall notify the Engineer-in-charge of the fact and levels taken jointly withEngineerin- charge. The earth, murrum, sand, gravel etc. or such materials suitable for fillingproposed to be filled under floors and so mentioned in t he item of schedule of quantitiesshall then be brought to site from approved locations and sources.

Earth Filling:

The earth, soft murrum etc. so brought shall be filled up in layers of 15 cm depth,each layer being well watered and consolidated by approved hand or mechanical tampers orother suitable means to achieve the required density.

Gravel or sand filling:

Gravel if required to be filled under floors, shall be single washed gravel of approvedquality and of size varying from 12mm t0 20mm. it shall be uniformly blind with approvedtype of soil and / or sand to obtain full compaction. Gravel shall be filled in specified thicknessand shall be well watered and rammed entirely to the satisfaction of the Engineer- in-charge.Ifsand is required to be filled under floors, it shall be clean, medium grained and free fromimpurities. The filled in sand shall be kept flooded with water for 24hrs. to ensure maximumconsolidation shall be done by the contractor at his own cost. The surface shallthen be well dressed and got approved from Engineer-in-charge before any other work is takenover the fill.

Lead and Lift:

Lead: The lead for disposal / deposition of excavated materials shall be as specified in the respective item of work. For the purpose of measurements of lead, the area to be excavated or the leads which shall be measured by the shortest straight line route on the plan and not theactual route adopted.

Lift: Lift shall be measured from ground level. Excavation up to 1.5m depth below groundlevel and depositing excavated material on the ground shall be included in the item ofearthwork for various kinds of soil. Extra lift shall be measured in unit of 1.5m

or partthereof. Obvious lift shall only be measured that is lifts inherent in the lead due to groundslope shall not be measured, except for lead up to 250m. All excavation shall be measured insuccessive stages of 1.5m stating the commencing level. This shall not apply to cases whereno lift is involved as in hill side cutting.

Mode of Measurements:

All excavation in areas having depth more than 30cm. pits, trenches etc. shall bemeasured net. The dimensions for the purpose of payment shall be reckoned on the horizontalarea of the excavations for the purpose of payment shll be reckoned on the horizontal area ofthe excavation at the base for foundations of the walls, columns, footings, rafts or otherfoundations, multiplied by the mean depth from the surface of ground determined by levels.Excavation for side slopes will not be paid for. Excavation in areas having depths less than 30 cm. shall be measured as surface excavation on square meter basis, mentioning the averagedepth of excavation.Reasonable working space beyond concrete dimension required for waterproofing and

shuttering where considered necessary in the opinion of Engineer-in-charge will be allowedin execution and considered for payment for underground water tank, sump septic tank etc.Where direct measurements of rock excavation are not possible, volume of rock can becalculated on the basis of length, breadth, and depth of stacks made at site as mentioned . The net volume shall be worked out by reducing it by 40% taking the voidsinto consideration as 40%. Similarly to arrive at net quantity to be paid in the case of soilreduction at 20% of corresponding stack / truck measurements shall be made. The rate forexcavation shall include carting and disposing and leveling the excavated materials within thespecified lead. The rate shall also be inclusive of cost of all tools, plants, explosives, shoring,dewatering at various stages, labour, materials etc. to

complete all the operations specified.The backfilling and consolidation in sides of foundation and in plinth with excavatedmaterial will not be paid for separately. The rate quoted for excavation shall be deemed tohave been included the cost of stacking of excavated materials, conveying within the specifiedlead, picking of selected stacked materials, conveying it to the place of finalbackfill, compaction to the required proctor density etc. Payment for filling and consolidationinside the trenches, sides offoundations, plinth etc. with selected materials brought by thecontractor other than

the excavated material, shall be paid for separately as per the rates inschedule of quantities which includes cost of such materials/ excavation, royalty, itsconveyance within the specified lead, watering, consolidating, dressing etc. Actual quantityof consolidated filling shall be measured and paid in cubic meters up to two places of decimal.The rate quoted in cum. for items of excavation is deemed to include the necessary additionalquantity of excavation involved beyond the plan dimensions of the work which may be

necessary to be carried out for carrying out the work in an engineering made, decided upon bythe contractor. Therefore no extra payment will be made for any excavation done other thanthe required quantity as per the plan dimension indicated in the drawings. Measurements forexcavation over areas shall be determined by levels or by "Dead men" or both at the discretionof the Engineer-in-charge. If however the Engineer-in-charge decided on measurement bylevels, levels of site shall be jointly taken and recorded by the Engineer- incharge or hisrepresentatives and the contractor, before commencement of the work and after completion ofthe work and the quantity of work done shall be computed based on these levels. The volumeof earth work shall be computed based on "Simpson's formula " or any other approved methodat the discretion of the Engineer-in-charge.

3.1.3.2 ANTITERMITE TREATMENT:

General:

Pre constructional anti-termite treatment is a process in which soil treatment is applied to a building in early stages of its construction. The purpose of anti-termite treatment is to provide the building with a chemical barrier against the sub-terrain termites. Anti-termite treatment being a specialized job, calls for thorough knowledge of the chemicals, soils, termite to be dealt with and the environmental conditions, in order to give effective treatment and lasting protection to the property undergoing treatment. It is therefore imperative that the works of anti-termite treatment should be got executed through specialized agencies only. The specialized agency should be preferably a member of the Indian pest control Association and shall have sufficient experience of carrying out similar works of magnitude envisaged in this tender. The pre

constructional soil treatment is required to be applied during the construction stages of the sub-structure up to plinth level. The contractor has to be watchful of the variousstages of sub-structure works and arrange to carry out the soil treatment in time after propercoordination with Department and other contractors if any, working at site.

Scope:

The scope of pre constructional anti-termite treatment covers the soil treatment withapproved chemicals in water emulsion in foundation trenches for columns, plinth beams,plinth filling, at junction of walls and floor, in expansion joints etc. in stages as detailed inthis specifications and drawings. Unless otherwise stipulated, the anti-termite treatment willbe carried out as per IS 6313 (part II) 1981 and / or as per direction of the Engineer-incharge.

Site preparation:

In order to ensure uniform distribution of the chemical emulsion and to assistpenetration, the following site preparation shall be carried out:

a) Remove all trees, stumps, logs or roots from the building site.

b) Remove all concrete form work if left anywhere, leveling pegs, timber off- cuts and otherbuilding debris from the area to be treated.

c) If the soil to be treated is sandy or porous, preliminary moistening will be required to fillcapillary spaces in soil in order to prevent the loss of emulsion through piping or excessivepercolations.

d) In the event of water logging of foundation, the water shall be pumped out beforeapplication of chemical emulsion and it should be applied only when the soil is absorbent

e) On clays and other heavy soils where penetration is likely to be slow and on sloping sites,where run-off of the treating solution is likely to occur, the surface of the soil should bescarified to a depth of 75mm at least.

f) All sub-floor leveling and grading should be completed. All cutting trenches andexcavations should be completed with backfilling in place, borrowed fill must be free fromorganic debris and shall be well compacted. If this is not done supplementary treatmentsshould be made to complete the barrier.

Chemical to be used:

The effectiveness of chemical depends upon the choice of the chemical, the dosageadopted and the thoroughness of application. The chemical solutions or emulsions arerequired to be dispersed uniformly in the soil and to the required strength so as to form aneffective chemical barrier which is lethal and repellent to termites.

Soil treatment:

One of the following chemicals in water emulsion, after approval from the Engineerinchargeshall be used uniformly over the area to be treated.

Mode and Rate of Application:

The chemical emulsion as stated above will be applied uniformly by sprayers at theprescribed rates as detailed below in all the sages of the treatment.

Treatment in Foundation Trenches:

In case of normal wall load bearing structures, columns pits, wall trenches andbasement, the treatment shall be at 5 litres/sqm. or surface area of the bottom and sides to aheight of at least 300mm. After the foundation work, the sides shall be treated at 7.5litres/sqm. of vertical surface of substructure on each side. After the earth filling is done,treatment shall be done by rodding the earth at 150mm centers close to wall surface andspraying the chemical with the above dose i.e. 7.5 litres/sqm. In case of framed structure, thetreatment shall start at a depth of 500mm below ground level. From this depth the backfillaround the columns, beams and R.C.C. basement walls shall be treated at 7.5 litres / sqm. Ofthe vertical and at 5 litres / sqm. for the horizontal surface at the bottom in the trenches / pits.

Treatment on Top Surfaces on Plinth Filling:

The top surface of the filled earth within plinth walls shall be treated with chemical emulsion at the rate of 5 litres/sqm. of the surface area before sub-base to floor is laid. Iffilled earth has been well rammed and the surface does not allow the emulsion to seepthrough, holes up to 50 to 75mm deep at 150 mm centers both ways shall be made with crowbars on the surface to facilitate saturation of the soil with the emulsion.

Treatment at Junction of Walls and floors:

Special care shall be taken to establish continuity of the vertical chemical barrier on the

inner wall surfaces from the finished ground level (or from level where the treatment hadstopped) up to the level of the filled earth surface. To achieve this a small channel 30 X 30mm. shall be made at all the junctions of wall / column with floor (before laying sub-grade)and rod holes made in the channel up to the finished ground level at 150mm apart and the ironrod moved backward and forward to break the earth and chemical emulsion poured along the channel at 7.5 litres (or at recommended quantity per sqm. of the vertical wall / columnsurfaces so as to soak the soil right up to the bottom. The soil shall be tamped back into placeafter this operation.

Treatment for Expansion Joints:

The soil beneath the expansion joins shall receive special attention when the treatmentunder 2.5.1 above is in progress. This treatment shall be supplemented by treating through theexpansion joint after sub-grade has been laid at the rate of 2 litres per metre length ofexpansion joint.

Precautions during Treatment:

1. Utmost care shall be taken to see that the chemical barrier is complete and continuous. Eachpart of the area shall receive the prescribed dosage of chemical emulsion.

2. The treatment should not be carried out when it is raining or when the soil is wet withrain or sub-soil water.

3. Once formed, the treated soil barrier shall not be disturbed. If by chance, treated soilbarriers are disturbed, immediate steps shall be taken to restore the continuity andcompleteness of the barrier system.

Precautions for Health Hazards and Safety Measures:

All the chemicals mentioned above are poisonous and hazardous to health. Thesechemicals can have an adverse effect upon health when absorbed through the skin, inhaled as vapours or spray mist or swallowed. Persons handling or using these chemicals should bewarned of these dangers and advised that absorption through the skin is the most likelysource of accidental poisoning. They should be cautioned to observe carefully all the safetyprecautions particularly when handling these chemicals in the form of concentrates. Thesechemicals are usually brought to the site in the form

of emulsion concentrates. Thecontainers should be clearly labeled and should be stored carefully out of the reach ofchildren and pets animal. They should be kept securely locked. Particular care should betaken to prevent skin contact with concentrates. Prolonged exposure to dilute emulsionsshould also be avoided. Workers should wear clean clothing and should wash thoroughlywith soap and water especially before eating. In the event of severe contamination, clothingshould be removed at once and the skin washed with soap and water. If chemicals splash intothe eyes they shall be flushed with plenty of water and immediate medical attention should besought.

The concentrates are oil solutions and present a fire hazard owing to the use of petroleum solvents. Flames should not be allowed during mixing. Care should be taken in the application of chemicals / soil toxicants to see that they are not allowed to contaminate wellsor springs and other sources of drinking water.

Guarantee :

The contractor has to furnish the guarantee for 10 (ten) years from the date ofcompletion of work, starting that in case of reappearance of termites within the building areadue to defective materials or workmanship or due to any other reasons, the contractor will arryout the necessary post constructional treatment to keep the entire area free from termite, onceagain, without any extra cost to the Department during the guarantee period.

Mode of measurement:

The payment will be made on the basis of plinth area measurements at ground flooronly for all the stages of treatment in sqm. correct to two places of decimals. Rate includesthe cost of materials, labour and all tools, plants, sprayers required for complete operation.

3.1.3.3 HARD CORE / SOLING UNDER FLOORS / FOUNDATIONS:

Scope of work:

The work covered under this specification includes all type of soling work either bybricks or by rubble stones laid under floors / foundations, hand packed, complete as perspecification mentioned below and applicable drawings.

Rubble Stone Soling:

The rubble stone shall be of best variety of black trap / granite / basalt or otherapproved-variety of stone available locally. The stone shall be hard, durable free from defectsand of required size and shall be approved by the Engineer-in-charge.

Preparation of Surface:

The bed on which rubble soling is to be laid shall be cleared of all loose materials,leveled, watered ad compacted and got approved by the Engineer-in-charge before layingrubble soling. Cable or pipe trenches if shown in the drawing and as required by theEngineer-in-charge shall be got done before the soling is started.

Workmanship:

Over the prepared surface, the stone shall be set as closely as possible and wellpacked and firmly set. The stones shall be of full height and shall be laid so as to have theirbases of the largest area resting on the sub-grade. Soling shall be laid in one layer of 230mmor 150mm depth or specified thickness of soling with a tolerance of 25mm. After packing thestones properly in position, the interstices between them shall be carefully filled with quarryspoils or stone chips of larger size possible to obtain a bard, compact surface. Spreading ofloose spoils or stone chips is prohibited. The entire surface shall be examined for anyprotrusions and the same shall be knocked off by a hammer and all interstices shall be filled with approved murrum. Excess murrum if any over the surfaces shall be removed. Unless other wise specified, the murrum shall be supplied by the contractor at his own cost from theselected area. The surfaces shall then be watered and consolidated with mechanical orsufficiently heavy wooden tampers and log-rammers as approved by the Engineer. Aftercompaction, the Engineer-in-charge to give the required slope or level and dense sub-baseand the surface shall present clean look. Adequate care shall be taken by the contractor whilelaying and compacting the rubble soling to see that concrete surfaces in contact with solingare not damaged.

Mode of Measurement:

The quoted rate shall be per square meter of the soling of specified thickness. Thelinear dimension shall be measured up to two places of decimals of a meter and are workedout

correct to the two places of decimals of a square meter. Plan areas of soling work actuallydone limiting to the dimensions as per drawings shall be measured for payment. The rateshall include all the materials labour, transport etc. and no extra payment shall be made forwork done at different levels. The rate shall also include the cost of preparation of surface, all materials and labour, watering, consolidation etc. all complete

3.1.3.4 REINFORCED CONCRETE AND ALLIED WORKS:

Scope:

This specification covers the general requirements for concrete jobs, using on-siteproduction facilities including requirements in regard to the quantity, handling, storage ofingredients, proportioning, batching, mixing and testing of concrete and also requirements inregard to the quality. This also covers the transportation of concrete from the mixer to theplace of final deposit and the placing, consolidation, curing, protecting, repairing ad finishingof concrete. After award of the work, if so desired by the contractor, he / they may be allowedby the Engineer-in-charge till the designed mix is obtained, to carry out the reinforce concretework In foundation and plinth as per equivalent nominal mix against the specified design mixconcrete as per IS Codes. However, all other specification for design mix shall govern fornominal mix also and nothing extra shall be paid for use of extra cement on this accountwhether the cement is supplied by the Department or procured by the contractor.

Cement Concrete (Plain and Reinforced):

The quality of materials and method and control of manufacture and transportation ofall concrete work in respect of mix, where reinforced or otherwise, shall conform to the applicable portions of these specifications. The Engineer-in-charge shall have the right toinspect the sources of materials, the layout and operation of procurement and storage ofmaterials, the concrete batching and mixing equipments and the quality control system. Suchan inspection shall be arranged by the contractor and the Engineer-in-charge's approval shallbe obtained prior to starting the concrete work.

Materials for Standard Concrete:

The ingredients to be used in the manufacture of standard concrete shall consist solelyof a standard type Portland cement, clean sand, natural coarse aggregate, clean water, ice andadmixtures if specially called for as per drawings or schedule of quantities.

Cement :

Unless otherwise specified or called for by the Engineer-in-charge, cement shall beordinary Portland cement in 50 kg bags. The use of bulk cement will be permitted only withthe approval of the Engineer-in-charge.

. Not more than 12 bags shall bestacked in any tier. The storage arrangement shall be got approved by the Engineer-in-charge.

Consignments in cement shall be stored as received and shall be consumed in the order of theirdelivery. Contractor shall establish cement/concrete/soil testing laboratories at site of workwith qualified person to handle the laboratory. Every consignment of cement procured shallaccompany test certificate from the company indicating lot No etc. Sample shall be taken foreach lot and sent to Standard Approved Material Testing

Laboratory for physical andchemical analysis. The cost of testing shall be borne by the Contractor.Cement held in store for a period of 90 (ninety) days or longer shall be retested beforeuse in work. Should at any time the Engineer-in-charge have reasons to consider that anycement is defective, then irrespective of its origin and / or manufacturers test certificate, suchcement shall be tested immediately at a National Test Laboratory / Departmental Laboratoryor such approved laboratory, and until the results of such tests are found satisfactory, it shallnot be used in any work.

Aggregates:

"Aggregate" in general designates both fine and coarse inert materials used in themanufacture of concrete."Fine Aggregate" is aggregate most of which passes through 4.75 mm I.S. sieve."Coarse Aggregate" is aggregate most of which is retained on 4.75 mm I.S. sieve. All fine andcoarse aggregates proposed for use in the work shall be subject to the Engineer-in-charge'sapproval and after specific materials have been accepted, the source of supply of suchmaterials shall not be changed without prior approval of the Engineer-in- charge. Aggregateshall, except as noted above, consists of natural sand, crushed stone and gravel from a sourceknown to produce satisfactory aggregate for concrete and shall be chemically inert, strong,hard, curable against weathering, of limited porosity and free from deleterious materials thatmay cause corrosion to the reinforcement or may impair the strength and / or durability ofconcrete. The grading of aggregates shall be such as to produce a dense concrete of and shallbe based on the "mix design" and preliminary test on concrete specified hereinafter.

Sampling and Testing:

Sampling of the aggregates for mix design and determination of suitability shall betaken under the supervision of the Engineer-in-charge and delivered to the laboratory, well inadvance of the schedule placing of concrete. Record of tests which have been made onproposed aggregates and on concrete made from this source of aggregates shall be furnishedto the Engineer-in-charge in advance of the work or use, in determining suitability of the proposed aggregate.

Storage of aggregates:

All coarse and fine aggregates shall be stacked separately in stock pile in the material yardnear the work site in bins properly constructed to avoid inter mixing of differentaggregates. Contamination with foreign materials and earth during storage and while heapingthe materials shall be avoided. The aggregate must be of specified quality not only at the timeof receiving at site but also at the time of loading into mixer. Rakers shall be used for liftingthe coarse aggregate from bins or stock piles. Coarse aggregate shall be piled in layers notexceeding 1.00 meters in height to prevent conning or segregation. Each layer shall cover theentire area of the stock pile before succeeding layers are started. Aggregates that havebecome segregated shall be rejected. Rejected materials after remixing may be accepted, ifsubsequent tests demonstrate conformity with required gradation.

Specific Gravity:

Aggregates having a specific gravity below 2.6 (saturated surface dry basis) shall not be used without special permission of the Engineer-in-charge.

Fine Aggregate:

Fine aggregate except as noted above, and for other than light weight concrete shallconsist of natural or crushed sand conforming to IS 383. The sand shall be clean, sharp, hard,strong and durable and shall be free from dust, vegetable substances, adherent coating, clay,loam, alkali, organic matter mica, salt or other deleterious substances which can be injuriousto the setting qualities / strength / durability of concrete.

Screening and Washing:

Sand shall be prepared for use by such screening or washing or both as necessary, toremove all objectionable foreign matter while separating the sand grains to the required sizefractions. Sand with silt content more than 3 percent will not be permitted to be used unlesssame is washed and silt content is brought within 3% by weight.

GRADATION: Unless otherwise directed or approved, the grading of sand shall be within thelimit indicated hereunder:-

Where the grading falls outside the limits of any particular grading zone of sieves, other than 600 micron (IS) sieve by not more than 5% it shall be regarded as falling within that grading zone. This tolerance shall not be applied to percentage passing the 600

micron (IS)sieve or to percentage passing any other sieve size on the coarser limit of grading zone I orthe finer limit of grading zone IV. Fine aggregates conforming to Grading zone IV shall notbe used unless mix designs and preliminary tests have shown its suitability for producingconcrete of specified strength and workability.

Fineness Modulus:

The sand shall have a fineness modulus of not less than 2.2 or more than 3.2 thefineness modulus is determined by adding the cumulative. Percentages retained on thefollowing IS sieve sizes (4.75 mm, 2.36 mm, 1.18mm, 600 micron, 300 micron and 150micron) and dividing the sum by 100.

Coarse Aggregate:

Coarse aggregate for concrete except as noted above and for other than light weightconcrete shall conform to IS 383. This shall consist of natural or crushed stone and gravel, andshall be clean and free from elongated, flaky or laminated pieces, adhering coatings, claylumps, coal residue, clinkers, sag, alkali, mica, organic matter or other deleterious matter.The coarse aggregate and fine aggregate shall be tested from time to time as required by theEngineer-in-charge to ascertain its suitability for use in construction and the charges fortesting aggregate shall be born by the contractor as specified herein after.

Screening and Washing:

Crushed rock shall be screened and / or washed for the removal of dirt or dust coating, if sodemanded by Engineer-in-charge.

Water:

Water used for both mixing and curing shall be free from injurious amount of deleteriousmaterials; potable waters are generally satisfactory for mixing and curing concrete. In case ofdoubt, the suitability of water for making concrete shall be ascertained by the compressivestrength and initial setting time test specified in IS 456. The sample of water taken for testingshall be typical of the water proposed to be used for concreting, due account being paid toseasonal variation. The samples shall not receive any treatment before testing other than thatenvisaged in the regular supply of water proposed for use in concrete. The sample shall bestored in a clean container

previously rinsed out with similar water. Average 28 dayscompressive strength of at least three 150mm concrete cubes prepared with water proposed tobe used shall not be less than 90% of the average strength of three similar concrete cubesprepared with distilled water. The initial setting time of test block made with the appropriatetest cement and the water proposed to be used shall not be less than 30 minutes and shall notdiffer by more than (+) 30 minutes form the initial setting time of control test block preparedwith the appropriate test cement and distilled water. The test blocks shall be prepared andtested in accordance it the requirements of IS 4031. Where water can be shown to contain anexcess of acid, alkali, sugar or salt, Engineer-in-charge may refuse to permit its use. As aguide, the following concentrations represent the maximum permissible values.

Limits of acidity:

To neutralize 200ml sample of water, using phenolphthalein as an indicator, it shouldnot require more than 2ml of 0.1 normal NaOH. The details of test shall be as given in IS3025.

Limits of alkalinity:

To neutralize 200ml sample of water, using methyl orange as an indicator, it should notrequire more than 10ml of 0.1 normal HCL. The details of test shall be as given in IS3025.

3.1.3.5FORMWORK

General:

The form work shall consist of shores, bracings, sides of beams and columns, bottom of slabs etc, including ties, anchors, hangers, inserts etc. complete which shall be properly designedand planned for the work. The false work shall be so constructed that up and down verticaladjustment can be made smoothly. Wedges may be used at the top or bottom of timbershores, but not at both ends, to facilitate vertical adjustment and dismantling of form work.

Design of FormWor

The design and engineering of form work as well as its construction shall be theresponsibility of Contractor. The drawings and calculations for the design of the form work shallbe submitted well in advance to the Engineer-in-charge for approval before proceeding with work,at no extra cost to the Department. Engineer-in-charge's approval shall not however, relieveContractor of the full responsibility for the design and construction for the form work. The designshall take into account all the loads vertical as well as lateral that theforms will be carrying including live and vibration loadings.

Tolerances:

Tolerances are specified permissible variation from lines, grade or dimensions given in drawings. No tolerances specified for horizontal or vertical buildings lines or footings. Unlessotherwise specified, the following tolerances will be permitted.

Tolerances for R.C. Buildings:

i) Variation from the plumb:

a) In the line ad surfaces of columns, piers, walls and in buttresses: 5 mm per 2.5m, but notmore than 25 mm.

b) For exposed corner columns ad other conspicuous linesIn any bay or 5 m, maximum : (+) 5 mm In 10 m or more: (+) 10mm

ii) Variation from the level or from the grades indicated on the drawings.

a) In slab soffits, ceilings, beam soffits and in arises.

b) In 2.5m (+) 5mm In any bay or 5m maximum (+) 8 mm In 10 or more (+) 15mm

c) For exposed lintels, sills, parapets, horizontal grooves and conspicuous lines

iii) Variation of the linear building lines from established position in plan and related position ofcolumns, walls and partitions. In any bay or 5m maximum (+) 10 mm In 10 or more (+)20mm

iv) Variation in the sizes ad locations of sleeves, openings in walls and floors except in thecase of and for anchor bolts : (+) 5mm

v) Variation in cross sectional dimensions of columns and beams and in the thickness of slabs and walls: (+) 10 mm/(-)5mm

vi) Footing :

a) Variation in dimensions in plan (+) 50mm/(-) 5mm.V- Page 55 of 197

b) Misplacement or eccentricity: 2% of footing within the direction of misplacement but notmore than 50mm.

c) Reduction in thickness (-) 5% of specified thickness subject to maximum of 50mm.

vii)Variation in steps:

a) In a flight of stairsRise (+) 3.0 mmTread (+) 5.0 mm

b) Consecutive steps Rise (+) 1.5 mm Tread (+) 3.0 mm

3.1.3.6STEEL REINFORCEMENT

Steel reinforcement bars, if supplied or arranged by contractor, shall be either plain roundmild steel bars grade as per IS 432 (part-I) or medium tensile steel bars as per IS 452 (part-I) orhot rolled mild steel ad medium tensile steel deformed bars as per IS 1139 or cold twisted steelbars and hot weld strength deformed bars as per IS 1786, as shown and specified on the drawings.Wire mesh or fabric shall be in accordance with IS 1566. Substitution of reinforcement will not bepermitted except upon written approval from Engineer-in-charge.

Storage :

The reinforcement steel shall not be kept in direct contact with ground but stacked on topof an arrangement of timber sleepers or the like. Reinforcement steel shall be with cement washbefore stacking to prevent scale and rust. Fabricated reinforcement shall be carefully stock toprevent damage, distortion, corrosion ad deteriorations.

Quality :

All steel shall be grade I quality unless specifically permitted by the Engineer-incharge.No rolled material will e accepted. If demanded by the Engineer-in-charge.Contractor shall submit the manufacturers test certificate for steel. Random tests on steelsupplied by contractor may be performed by Department as per relevant Indian Standards. Allcosts incidental to such tests shall be at contractors expense. Steel not conforming tospecifications shall be rejected. All reinforcement shall be clean, free from grease, oil, paint, dirt loose mill, scale dust, bituminous materials or any other

substances that will destroy or reducethe bond. All rods shall be thoroughly cleaned before being fabricated. Pitted and defectiverods shall not be used. All bars shall be rigidly held in position before concreting. No weldingof rods to obtain continuity shall be allowed unless approved by the Engineer-in- charge. Ifwelding is approved, the work shall be carried as per 2751, according to best modernpractices ad as directed by the Engineer-in-charge in all cases of important connections, tests shallbe made to prove that the joints are of the full strength of bars welded. Special specifications, asspecified by the Engineer-in-charge, shall be adhered to in the welding of cold workedreinforcing bars and bars other than mild steel.

Laps :

Laps ad splices for reinforcement shall be shown in the drawings. Splices, in adjacent barsshall be staggered ad the locations of all splices, except those specified on the drawing shall beapproved by the Engineer-in-charge. The bars shall not be lapped unless the length requiredexceeds the maximum available length of bars at site.

Bending :

All bars shall be accurately bent according to the sizes ad shapes shown on thedetailed working drawings/ bar being schedules. They shall be bent gradually by machine or otherapproved means. Reinforcing bars shall not be straightened and re-bent in a manner that will injurethe materials. Bars containing cracks or splits shall be rejected. They shall be bent cold, exceptbars of over 25mm in diameter which may be bent hot if specifically approved by the Engineerin charge.

Bars bent hot shall not be heated beyond cherry red colour (not exceeding 645oC) and after bending shall be allowed to cool slowly without quenching. Bars incorrectly bent shall beused only of ht means used for straightening and rebinding be such as shall not, in the opinionof the Engineer-in-charge injure the material. NO reinforcement bar shall be bent when inposition in the work without approval, whether or not it is partially embedded in hardenedconcrete. Bars having links or bends other than those required bydesign shall not be used.

Bending at Construction Joints :

Where reinforcement bars are bent aide at construction joints and afterwards bentback into their original position, care should be taken to ensure that no time the radius of the

bend is less than 4 bar diameters for plain mild steel or 6 bar diameters for deformed bars. Care shallalso be taken when bending back bars to ensure that the concrete around the bar is not damaged.

Fixing / Placing ad Tolerance on Placing :

Reinforcement shall be accurately fixed by ay approved means maintain din the correct position as shown in the drawings by the use of blocks, spacer and chairs as per IS 2502 to preventdisplacement during placing ad compaction of concrete. Bar intended to be in contact at crossingpoint shall be securely bound together at all such points with number 16 gauge annealed soft ironwire. The vertical distances required between successive layers of bars in beams or similarmembers shall be maintained by the provision of mild steel spacer bars at such intervals that themain bars do not perceptibly sag between adjacent spacer bars.

Tolerance on placing of reinforcement :

Unless otherwise specified by the Engineer-in-charge, reinforcement shall be placed withinthe following tolerances:

Tolerance in spacing

a) For effective depth, 200 mm or less + 10 mm

b) For effective depth, more than 200 mm + 15 mm

Cover to Reinforcement :

The cover shall in no case be reduced by more than one third of specified cover or5mm whichever is less. Unless indicated otherwise on the drawings, clear concrete cover for reinforcement (exclusive of plaster or other decorative finish shall be as follows) :

a) At each end of reinforcing bar not less than 25 mm, nor less than twice the diameter of suchbar.

b) For a longitudinal reinforcing bar not less than 25 mm, nor more than 40 mm, nor lessthan the diameter of such bar. In the case of column of maximum dimensions of 200mm or under,whose reinforcing bars do not exceed 12mm, a cover of 25mm may be used.

c) For longitudinal reinforcing bar in a bar, not less than 25 mm nor less than the diameter of suchbar and.

d) For tensile, compressive, shear, or other reinforcement in a slab, not less than 25mm,

nor less than the diameter of such bar and.

e) For any other reinforcement not less than 15mm, nor less than the diameter of such bar.

f) Increased cover thickness may be provided when surfaces of concrete members are exposed tothe action of harmful chemicals (as in the case of concrete in contact with earth facescontaminated with such chemicals), acid, vapour, saline, railways) etc. and suchincrease of cover may be between 15mm and 50 mm beyond the figures given in (a to e)above as may be specified by the Engineer-in-charge.

g) For reinforced concrete members, totally immersed in sea water the cover shall be 40mm, morethan specified (a to e) above.

h) For reinforced concrete members, periodically immersed in sea water or subject to sea spray, thecover of concrete shall be 50 mm more than that specified (a to e) above.

i) For concrete of grade M25 and above, the additional thickness of cover specified in (f),(g) and (h) above a my be reduced to half. In all such cases the cover should not exceed75mm.

j) Protection to reinforcement in case of concrete exposed to harmful surroundings may also be given by providing a dense impermeable concrete with approved protective coating asspecified on the drawings. In such case, the extra cover, mentioned in (h) and (i) above, may bereduced by the Engineer-in-charge, to those shown on the drawing.

k) The correct cover shall be maintained by cement mortar briquettes or other approved means.Reinforcement for footings, grade beams ad slabs on sub grade shall be supported on preciseconcrete blocks as approved by the Engineer-in-charge. The use of pebbles or stones shall bepermitted.

l) The minimum clear distance between reinforcing bars shall be in accordance with IS 456.

3.1.3.7STRUCTURAL STEEL

Scope of Work :

The work covered by this specification consists of furnishing ad erecting of structural steelcomplete in strict accordance with this specifications ad the applicable drawings.

Materials :

All structural steel shall be of standard sections as marked on the drawings ad shall be freeof scale, blisters, laminations, cracked edges ad defects of any sort. If the structural steelis not supplied by the Department and the Contractor is required to bring such steel, the Contractor shall furnish duplicate copies of all mill orders and / or also the test reportreceived from the mills, to satisfy the Engineer-in-charge. All structural steel and electrodes shallcomply in all respects with relevant I.S.S. for structural steel.

Workmanship :

All workmanship shall be of first class quality in every respect to get greatestaccuracy to ensure that all parts will fit together properly on erection. All ends shall be cut trueto planes. They must fit the abutting surfaces closely. All stiffeners shall fit tightly at both ends. All holes in plates and section between 12mm and 20 mm thick shall be punched to suchdiameter that 3mm of metal is left all around the hole to be cleaned out to correct size by reamer.The base connection shall be provided as shown on drawings and the greatest accuracy ofworkmanship shall be ensured to provide the best connections. Figured dimensions on thedrawings shall be taken.

Erection and Marking :

Erection ad fabrication shall be according to IS 800-1984 section –11. Duringerection, the work shall be securely braced and fastened temporarily to provide safety for allerection stresses etc. No permanent welding shall be done until proper alignment has beenobtained. Any part which do not fit accurately or which are not in accordance with the drawingsand specifications shall be liable to rejection and if rejected, shall be at once be made good.Engineer-in-charge shall have full liberty at all reasonable times to enter the contractors premisesfor the purpose of inspecting the work and no work shall be taken down, painted r dispatcheduntil it has been inspected and passed. The contractor shall supply free of charge all labour adtools required for testing of work.

Delivery at Site :

The contractor shall deliver the component parts of the steel work in an undamaged state atthe site of the works and the Engineer-in-charge shall be entitled to refuse acceptance of anyportion which has been bent or otherwise damaged before actual delivery on work. **Shop**

Drawing :

The shop drawings of structural steel based on contract drawings hall be submitted to theEngineer-in-charge. The necessary information for fabrication, erection, painting of structure etc.must be furnished immediately after acceptance of the leader.

Painting :

Painting should be strictly according to IS. 1477-1971 (Part-I-Pretreatment) and IS1477-1971 (part-II painting). Painting should be carried out on dry surfaces free from dust, scaleetc. The paint shall be approved by the Engineer-in-charge. Once coat of shop paint (red lead)shall be applied on steel, except where it is to be encased in concrete or where surfaces are to befield welded.

Welding

Welding shall be in accordance with IS. 816-1969,IS819-1957, IS 1024-1979,IS1261-1959, IS 1323-1982 and IS 9595-1980 as appropriate. For welding of any particulartype of joint, welders shall give evidence of having satisfactory completed appropriate test asdescribed in ay of IS 817-1966, IS 1393-1961, IS 7307 (part-I) –1974, IS 7310 (part-I) 1974 andIS 7318 (part-I) 1974 as relevant.

Welding Consumables:

Covered electrodes shall conform to IS 814 (part-I) – 1974 and IS814 (part-II)- 1974 or IS1395-1982 as appropriate. Filler rods and wires for gas welding shall conform to IS 1278-1972. The bar wire electrodes for submerged are welding shall conform t IS 7280-1974. Thecombination of are and flash shall satisfy the requirements of IS 3613-1974. The filler rods ad bare electrodes for gas shielded metal, are welding shall conform to IS 6419-1971 and IS 6560-1972 as appropriate .

Type of Welding :

Are welding (direct or alternating current) or Oxyacetylene welding may used. Field welding maybe used. Field welding shall be by D.C.

3.1.3.8 DAMP PROOF COURSE

Scope of work:

The work covered under this specifications consists supplying and laying plain cement concrete or cement plaster 1:3 as damp proof course with or without waterproofing admixturewith this specification and applicable drawings.

Workmanship :

Surface to receive damp proof course shall be cleaned and carefully wiped to remove alldust, laitance etc. and shall be approved by the Engineer-in-charge Damp proof course shown shall be cement concrete as per proportion indicated in the schedule or cementplaster in the ratio CM 1:3. Approved water proofing compound @ 2% by weight of cement or asdirected by the manufacturer shall be mixed in cement mortar for this concrete or plaster. Thedamp proof course shall be laid to the full width of the walls and the edges shall be straight, evenand truly vertical. Wooden forms shall be used to obtain good edges. No masonry work shall becommenced on freshly laid damp proof course unless it is cured for48hours of its laying by curing of damp proof course shall be continued along with the masonrywork. Specification for cement, sand, aggregate and water shall be as described herein before forconcrete works / cement plaster.

Mode of measurement :

The work shall be measured in sqm. area actually laid limited to sites as shown indrawing. The rate shall include cost of all the materials, labour etc. and scaffolding (if any).

3.1.3.9 BRICKWORK

Scope of work:

The work covered under this specification pertains to procurement of best quality locallyavailable bricks and workmanship of building walls of various thickness. In strict compliance withthe specifications and applicable drawings.

Materials :

Brick shall be best quality locally available bricks and shall be got approved by the Engineer-in-charge before incorporation in the work. The nominal size of bricks (F.P.S) shall be22.9 X 11.4 X7cm (9" X 4 1/2 X 2 3/4"). Permissible tolerance on dimensions shall be +3mm. in length and + 1.5 mm in width / thickness. The contractor shall get approved the sampleand source of bricks from Engineerin- charge before procurement on large scale and shallmaintain the same for the entire work. In case the size of bricks used in the work found lesser thanthe specified one for the whole lot : Extra cement consumed due to more number of joints and dueto additional thickness of plaster than

the specified in the tender to match with adjoining columnsand beams, shall be to contractor's account. If the plastering to be done is more than the specifiedthickness to bring the plaster surface to perfect line, level ad plumb with adjoining columns,beams walls etc., the contractor shall be responsible to provide and fix chicken wire mesh toreceive more thickness of plaster at his own cost and nothing extra will be paid on this account.

In case the size of bricks used in the work, found more than the permissible, the contractor shallchip out the exposed edges of bricks upto the required level of wall to receive specified thicknessof plaster at no extra cost. Bricks shall generally conform to IS 1077-1970. In anycase minimum crushing strength shall not be less than 35 kg/sq.cm and water absorption shall notbe more than 25% by weight. The Engineer-in-charge shall have the right to reject bricksobtained from any field where the soil have an appreciable quantity of sulphates andchlorides. The specifications for cement, sand and water shall be same as described hereinbefore under cement concrete. Bricks shall be thoroughly soaked in water before using till thebubbles ceases. No half or quarter brick shall be used except as closer. The closers shall be cut torequired size and used near the end of the walls. The walls shall be raised truly to plumb. The typeof bond to be adopted shall be decided by the Engineer-in-charge, but vertical jointsshall be laid staggered.

Workmanship :

Four courses of brick work with four joints should not exceed by more than 40mm thesame bricks piled one over the other without mortar. Brick work shall not be raised more than10 courses a day unless otherwise approved by the Engineer-in-charge. The brick work shall bekept wet for at least 7 days. Brick work shall be uniformly raised around and no part shall beraised more than 1.0 meter above another at any time.All joints shall be thoroughly flushed with mortar of mix as specified in the schedule ofquantities, at every courses. Care shall be taken to see that the bricks are bedded effectively and alljoints completely filled to the full depth. The joints of brick work to be plastered shall be raked outto a depth not less than 10mm as the work proceeds. The surface of brick work shall be cleaneddown and wiped properly before the mortar sets.

The adhesion between the brick masonry surface d the concrete surface of columns, beams, chajjas, lintels etc. should be proper by ensuring that the concrete surface coming incontact with brick masonry is backed / chipped / keyed, cleaned and cement slurry is applied sothat a proper bond is achieved between the two dissimilar materials. It is responsibility of thecontractors to ensure that there will not be any cracks / fissure anywhere in the brick masonry. Incase the cracks appear subsequently in those areas, they should be made good by cement groutingor epoxy putty grouting/ poly sulphide compound grouting or as per standard modern specifications/methods with the prior approval of the Engineer-in-charge, at thecost of the contractor. All the courses shall be laid truly horizontal and all vertical joints shall betruly vertical. Specified mortar of good and approved quality shall be used. Lime shall not be usedwhere reinforcement is provided in brick work. The mortar should completely cover the bed andsides of the bricks. Proper care should be taken to obtain uniform mortar joint thought out theconstruction. The walls should be raised uniformly in proper, approved bond. In construction ofthe wall, first of all two end corners are carefully laid to line and level ad then it between portionis built, with a cord stretching along the headers or stretchers held in position at the ends. Thishelps in keeping the alignment of the courses and marinating them in level. Similarly all other courses are building.

3.2 REPORT PREPARATION

3.2.1 Principles for report preparation

The report should be prepared in such a manner that on the study of report, onecan get an idea about the complete work.

The report should be given at the beginning of the estimate followed bycalculation, design, general and detailed specifications.

3.2.2 Report On Estimate Of Residential Building

Report On Estimates for the Construction of Residential Building.

The detailed estimate for construction of a residential building for the ExecutiveEngineeratUdaynagarhasbeenpreparedincomplianceofS.E.'sletterno… ……dated……..

There is no building for the residence of the Executive Engineer at Udaynagar and he has to live in a rented building with meager accommodation at a very high rent. It has, therefore, been proposed to construct a residential building for the Executive Engineer. The head of the accounts will be 50 civil original works,building.

The estimate provides for the following accommodation:-

One drawing room, one dining room, three bed rooms, one guest room, and the necessary store kitchen, baths, front and back verandahs and motor garage per planenclosed.

A site has already been selected having a land of 60 m - 30 m (200 - 100') for the construction of the building having good soil and proper drainage and this much of land has to be acquired. The building shall be oriented to face north direction.

The building shall have lime concrete foundation and first class brick masonry with lime mortar up to plinth level and the superstructure shall be of first class brick work in cement mortar, 1 :6 Lintels shall be of R.B. work and roof shall

be / R.C.C with lime concrete terrace finishing.Thedrawinganddiningroomsshallhavemosaicfloorandotherrooms2.5 cm(1') c.c. floor over 7.5 cm (3') lime concrete. Inside and outside walls shall be 12 mm (1/2 ,) cement line plastered 1:1:6, and ceiling shall be 6 mm (1/2') cement plastered 1:3. Inside of drawing and dining rooms shall be colour washed and inside of remaining rooms shall be white washed and outside wall be colour washed. Doors and windows shall be 4.5cm 1 $\frac{3}{4}$" thick teak wood with chaukhat or sal wood and enamel painted. All work shall be strictly as per detailed P.W.D. Specification.

The estimate has been prepared at P.W.D Schedule of rates, and for non-schedule items on analysis of rates. The foundation has been designed for a safe load of 9 tone per sq m (8 ton per sq ft) and the R.C.C roof has been designed for a safe load of 150 kg per sq m (30 1bs per sq ft) with 1400 kg per sq cm (20000 1bs per sq in) as sage tensile stress of steeland50 kg sq cm (750 1bs per sq in) as safe compressive stress of concrete. All designs and calculations have been included in the estimate. Plans and drawings and site plans are also enclosed with the estimate.

Provision has been made for electrification and sanitary and water supply works and 20% of the estimated cost of the building works ahs been included for these works. As there is no sewer line in the area a septic tank shall have to be constructed for which lump sum provision of Rs.700,00 has been made in theestimate.

Provision for compound with a gate in the front and barbed wire fencing on the sides and back, and approach road have also been made in the estimate.

A statement of important materials as cement, steel, coal, etc., which shall have to be arranged by the department is also enclosed with the estimate. A rent statement is also enclosed.

The work shall be carried on contract by inviting tenders. The workshall be completed within six months from the date of start.

3.2.3 Report On Estimate Of Culvert

The estimate has been prepared for the construction of an arch culvert of 3m span in15 km-300 m on Lucknow –Daulatpur road. The road at this point is flooded almost every year during the rainy reason, causing flood and damages in the area. During the last inspection the Executive Engineer has asked to prepare an estimate and this estimate has been prepared in compliance of E.E's letter no..... dated …….. the cost of construction will be met from 50 civil work specialrepairs.

The culvert has been designed for I.R.A Class a loading. The catchment area has been determined from the 2.5 cm (1ʻ) map of the area, which comes to1200 acres, and the water way has been calculated by the Talbot formula a –CA $^{3/4}$, where a = waterway in sq. ft , a= Catchment area in acres, and c= constant and has been taken as 0.2. All calculation and design have been enclosed with theestimate.

The soil has been tested and has been found to be good, and ordinary spread foundation will be sufficient.The foundation shall beof cement concrete 1:4:8 and abutments, wing walls and parapets shall be of brick masonry in 1:5 cement mortar, the arch work shall be of brick masonry in 1:3 cement mortar. Exposed surfaces shall be cement pointed 1:2. all works shall be as per detailed P.W.DSpecifications.

The estimate has been prepared at P.W.D Schedule of Rates. A statement of materials, cement, bricks, coal, etc., required for the construction , has been enclosed with he estimate. The work shall be executed on contract by inviting tenders and the work shall be started after the rainy season and shall be completed within four month'stime.

3.2.4 Report On Estimate Of Roads

The estimate for the construction of Hindnagar – kaliganj road of 25 km – 500 mlength has been prepared for linking Kalignaj with the District Headquarters in compliance with S.E.'s letter no……dated……

Kalignaj is an important market place for agricultural products and there are some cottage industries in the area, and there having no road the area is not being developed. The proposed road will also serve many villages on either side. The people of the locality have also represented and demanded separately for the construction of this road. It is therefore essential to construct this road. The proposal has been included in the Fourth Five year Plan and the cost will be met from the Road DevelopmentFund.

Alignment of the road follows an existing card road with straightening when necessary and avoiding congested areas as far as possible. Flat curves have been provided with a minimum radius of 150 m. In selecting the alignment principles of shortest route, serving maximum population, minimum drainage crossing easy gradient economy of construction, etc.., have been followed. The road passes mostly through uncultivated area in plane land, and mostly in banking of 60 cm to 90 cm high excepting a few places where the road passes in low where high banking will be required.

Planet table survey has been made for the whole length of the road for 60 m width on each side of the centre line and L-section has been prepared by taking levels at every 30 m and cross levels have been taken at every 90 meter. Formation line has been fixed to have easy gradient and ruling gradient of 1 in 40 has not reached anywhere. Highest flood level has been kept in view and formation line has been kept above normal floodlevel.

A number of culverts will be required along the length of the road and ridge of about 30 m span will be required across the stream in km 12. A list of

bridges and culverts of different span has been enclosed and provisions have been made on the basis of running meter of span at
the rate of Rs. 5,000.00 per r m of span for culverts and Rs. 6,000.00 per r m of span for bridges.
Bridges shall have to be designed on I.R.C class A Loading and their detailed estimate shall have to be prepared separately.

A present land of 30 m width shall be required and has been provided in the estimate. Temporary land for borrowpits shall be required for one year for taking earth for embankment and provision has beenmade accordingly.

The road shall be metalled with soling coat of brick on edge with over burnt bricks
and two coats of metalling, inter coat and top coat, each of 8 cm compacted layer with stone ballast. The two wearing coats shall be of one coat of bituminous painting. Provisions for metalling and painting have been made in the estimate accordingly. Brick shall be burnt by contract by the side of road distributed along the road in three brick kilns. Coal shall have to be supplied to contractors for burning bricks and a statement of coal requirement is enclosed. Stone metal shall be hard granite type and shall be collected from the approvedquarry.

The whole work of construction shall be spread in five years, earth work one year, rest for settlement one year, metal ling two years and painting one year.

Second coat bituminous painting shall be done after one year of 1st cost of painting and cost of painting shall be met from maintenance grant.

All works shall be done strictly as per detailed P.W.D Specifications. The estimate has been prepared at P.W.D Schedule of rates and local current rates and analysis of rates have been given forenoon-scheduleitems.The work shall be done by contract byinvitingtenders.

Survey Plan, L-sections and Cross-sections of the proposed road are enclosed with the estimate. An index plan showing the alignment has also been enclosed.

The estimate amounting to Rs. 25,00,000.00 has been submitted for sanction and allotment of fund.

3.3 TTT ACT 2000

TAMIL NADU TRANSPARENCY IN TENDERS RULES, 2000.

[Published in TNGGE No.700, Dated 1st October 2000 - Part-III Section 1(a) of. (No.SRO.A-81 (c) / 2000 - G.O.Ms.No.446 / 26th September, 2000)].

In exercise of the powers conferred by sub-section (1) of section 22 of the Tamil Nadu Transparency in Tenders Act, 1998 (Tamil Nadu Act 43 of 1998), the Governor of Tamil Nadu hereby makes the following rules, namely.-

CHAPTER-I.

PRELIMINARY.

1. **Short title and commencement.-** (a) These rules may be called the Tamil Nadu Transparency in Tenders Rules, 2000.

(b) They shall come into force on the date 1st October, 2000.

1[(c) These rules shall apply to all types of procurement except the procurement of Projects under the Public Private Partnerships.]

2. **Definitions.-** In these rules, unless there is anything repugnant in the subject or context,-

(a) **'Act'** means the Tamil Nadu Transparency in Tenders Act, 1998 (Tamil Nadu Act 43 of 1998);

(b) **'Supply and Installation Contract'** means a contract under which the tenderer is required to supply, erect, test and commission the equipment at the place specified by the Procuring Entity;

(c) **'Fixed Rate Contract'** means a contract where a set of rates and terms and conditions are fixed for the supply of unit quantities of goods or certain standardized services;

(d) **'Pre-qualification'** means the process by which the tenderers are first screened for their capability and resources to implement the contract before they are permitted to offer their tenders;

(e) **'Two-cover System'** means a procedure under which the tenderers are required to simultaneously submit two separate sealed covers, one containing the Earnest Money Deposit and the details of their capability to undertake the tender which will be opened first and the second cover containing the [2][financial] quotation which will be opened only if the tenderer is found qualified to execute the tender;

(f) **'Earnest Money Deposit (EMD)'** means the amount required to be remitted by a tenderer along with his tender indicating his willingness to implement the contract;

[3][(g) **'Lump-sum Contract'** means a contract under which a tenderer is engaged to carry out a work or effect supply as specified within a given period and for a fixed total price and the tenderer is paid depending on the completion of work or supply to specification and adherence to the time schedule:

Provided that where appropriate, unit rates or prices for each of the various items comprising such work or supply may also be specified to facilitate interim payments depending on the actual quantities of work executed or supplies effected.

(h) **'Multi-Stage Tender'** means a tender in which there are atleast two stages including an initial stage of short-listing based on the fulfillment of eligibility criteria based on experience and financial or technical parameters or both and a final stage in which only the qualified, short-listed tenderers are invited to submit their financial bids;

(i) **'Piece-Work Contract'** means a contract under which only unit rates or prices for various kinds of work or materials are agreed upon for a given period of time without reference to the total quantity of work to be done or the material to be supplied and the time period within which the work or supply is to be completed;

(j) **'Turn-key Contract'** is a contract under which the tenderer

is required to undertake within the framework specified by the Procuring Entity the entire responsibility for detailed investigation, planning, design, construction and commissioning of the total project.]

CHAPTER-II.

GENERAL.

3. **Categories of Procurement.-** (1) For the purposes of the application of these rules, procurement is categorized as follows, namely:-

(i) Construction; and

(ii) Supply of Goods and Services.

(2) While the provisions of these rules shall apply in general to each of the categories of procurement in sub-rule (1), where a specific provision has been made in the rules regarding any specific category, that specific provision shall prevail as against any general provision in so far as that category of procurement is concerned.

4. **Methods of Tendering.-** (1) Procurement of different categories shall be effected by the following methods of tendering, namely:-

(i) Piece-work Contract;

(ii) Lump-sum Contract;

(iii) Turn-key Contract;

(iv) Multi-stage contracting including pre-qualification and two cover system; and

(v) Fixed Rate Contract.

(2) The Tender Inviting Authority shall decide the method of tendering to be followed in each case having regard to the category, size and complexity of the procurement.

(3) While the provisions of these rules shall apply to each of the methods of procurement indicated in sub-rule (1) generally where a specific

provision has been made in these rules regarding a particular method of tendering, such specific provision shall prevail as against any general provision in so far as that particular method of tendering is concerned.

CHAPTER-III.

PUBLICITY.

5. **Publication of Tender Bulletin.-** (1) The District Tender Bulletin shall be published [4][by electronic mode] by the District Tender Bulletin Officer at least once in every week.

(2) The State Tender Bulletin shall be published [5][by electronic mode] by the State Tender Bulletin Officer at least once in every week.

(3) The Tender Bulletin Officer shall cause to be published all Notices Inviting Tenders and intimations of acceptance of tenders received upto twenty four hours prior to the actual publication of the bulletin.

(4) In case a Notice Inviting Tender or information relating to acceptance of the tender needs to be published urgently, then the Secretary to Government of the concerned administrative department in the case of the State Tender Bulletin or the District Collector in the case of the District Tender Bulletin can for reasons to be recorded in writing, direct the respective Tender Bulletin Officers to publish an extraordinary issue of the Tender Bulletin.

6. **Distribution of Tender Bulletins.-** [6][(1) The Tender Bulletin Officer shall deliver the Tender Bulletin to the registered subscribers by e-mail and publish tender bulletins in the dedicated website administered by the State Tender Bulletin Officer for viewing or downloading by tenderers or any person subscribing to Tender Bulletins.]

(3) Any person or institution can be enrolled as a regular subscriber to the tender bulletin on payment of a fixed fee annually, half-yearly or

quarterly, as the case may be.

7. **Tender Bulletin to contain information only.-** (1) The tender bulletin shall contain only information of the Notice Inviting Tenders and the orders accepting a tender and does not in itself create a legal right or liability.

(2) A Notice Inviting Tender will not be invalidated merely on the grounds that the notice although published in newspapers has not been published in one or the other of the District Tender Bulletins or State Tender Bulletins or when published in the State Tender Bulletin could not be published in a District Tender Bulletin or vice versa.

8. **Information to be published in the District Tender Bulletin.-** Subject to the provisions of rule 10, Notices Inviting Tenders and decisions on tenders in all cases where the value of the procurement exceeds rupees **8**[ten lakhs and is] below rupees twenty five lakhs shall be published in the District Tender Bulletin of the district where the headquarters of the Tender Inviting Authority is located and in the district where the work is to be executed or the goods and services supplied.

9. **Information to be published in the State Tender Bulletin.-** The Notice Inviting Tenders and decisions on tenders shall be published in the State Tender Bulletin in cases where.-

(a) The value of procurement exceeds rupees twenty five lakhs;

(b) The Tender Inviting Authority is a Secretary to Government, or a head of a Government department, or Local Authority or the Chief Executive of a Public Sector Undertaking, Statutory Board, Apex Cooperative Institution, University or State Level Society formed by the Government.

(c) In any other case, where the Tender Inviting Authority deems it fit.

10. **Details to be mentioned in Notice Inviting Tenders.-** The

Notice Inviting Tenders shall contain the following details, namely:-

(a) The name and address of the Procuring Entity and the designation and address of the Tender Inviting Authority;

(b) Name of the scheme, project or programme for which the procurement is to be effected;

(c) The date upto which and places from where the tender documents can be obtained;

(d) The amount of Earnest Money Deposit (EMD) payable;

(e) The last date and time for receipt of tenders;

(f) The date, time and place for opening of tenders received; and

(g) Any other information the Tender Inviting Authority considers relevant.

11. Publication of Notice Inviting Tenders in Newspapers.-

(1) The Tender Inviting Authority shall have the Notice Inviting Tenders published in the Indian Trade Journal in all cases where the value of procurement exceeds rupees **9**[seventy five crores].

10[(2) The Tender Inviting Authority shall have the Notice Inviting Tenders published in daily newspapers. The number, editions and language of the newspapers in which the Notice Inviting Tenders shall be published will be based on the value of procurement as specified in the Annexure.]

(3) In cases where publication of Tender Inviting Notice is to be done only in Newspapers with circulation within the District, the Information and Public Relations Officer attached to the District Collectorate shall be the competent authority to release the advertisement and in all other cases the competent authority to release the advertisement shall be the Director of Information and Public Relations, Chennai.

(4) The Notice Inviting Tender shall be given due publicity in

Newspapers and also on notice boards in the District Offices. For tenders above rupees fifty lakhs, Director of Information and Public Relations will publish the Notice Inviting Tenders as per instructions of the 11[Procuring Entity]. For other tenders, Director of Information and Public Relations will publish keeping in mind the request of the department. There should not be any additional insertion and no publication of Notice Inviting Tenders in newspapers not requested by the 11[Procuring Entity] for tenders above rupees fifty lakhs.

12. **Sending Notice Inviting Tenders to all possible tenderers.-** The Tender Inviting Authority may if he considers necessary, send the Notice Inviting Tenders to all possible tenderers including registered contractor, past supplier, any potential supplier and any other well known company or firm directly.

CHAPTER IV.

NOTICE INVITING TENDERS AND TENDER DOCUMENTS.

13. **Technical specifications contained in the Tender Documents.-** (1) The technical specifications contained in the tender documents shall include a detailed description of what is proposed to be procured.

(2) Unbiased technical specifications shall be prepared by observing the following safeguards, namely.-

(a) use of brand names and catalogue numbers shall be avoided and where it becomes unavoidable, along with the brand name the expression "or equivalent" shall be added:

12[Provided that such specifications should as far as practicable specify the output or service levels to be delivered.]

(b) wherever possible the appropriate Indian Standards with the

number shall be incorporated;

(c) in the case of construction tenders, detailed estimates shall be prepared by the competent technical authorities based on the schedule of rates and standard data as revised from time to time:

Provided that for large and prestigious projects, the Government shall permit any Procuring Entity to engage a qualified private architect or consultant to prepare the design and estimates; and

(d) in case alternative designs or materials are permitted, the conditions for their acceptability and the method of their evaluation shall be clearly stated.

[13]**13-A. General Condition.-** The tender document shall include a condition that all the contractors and sub-contractors hired by main contractors shall engage construction workers registered with the Construction Workers Welfare Board as required under the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 (Central Act 27 of 1996).]

14. **Commercial Conditions.-** [14](1) The tender documents shall require all tenderers without exception to pay an Earnest Money Deposit (EMD) ordinarily not exceeding one per cent of the value of the procurement by means of [electronic mode of payment or] in the form of a demand draft, bankers cheque, specified small savings instruments or where the procuring entity deems fit, irrevocable bank guarantee in a prescribed form. The tender documents shall clearly state that any tender submitted without the Earnest Money Deposit (EMD) in the approved form be summarily rejected:]

Provided that any category of tenderers specifically exempted by the Government from the payment of Earnest Money Deposit (EMD) will not be required to make such a deposit.

(2) The tender documents shall specify the period for which the tenderer should hold the **15**[financial bids] offered in the tender valid:

16[Provided that the initial period of validity shall ordinarily be ninety days.]

(3) The tender documents shall require that as a guarantee of the tenderer‟s performance of the contract, a security deposit be taken from the successful tenderer subject to the conditions that.-

(a) the amount of the deposit not exceeding five per cent of the value of the orders placed: and

17[(b) The deposit being in the form of electronic mode of payment or in the form of demand draft or banker‟s cheque or specified small savings instruments or where the procuring entity deems fit, irrevocable bank guarantee in an approved form.]

(4) The tender documents shall clearly indicate the payment terms conforming to the following requirements.-

18[(a) Payment shall ordinarily be effected only on completion of delivery against the orders placed:

Provided that payment of advance may be made in the following cases for sufficient reasons to be recorded by the Procuring Entity:-

(i) in cases where goods, commodities and services are procured through imports requiring opening of Letter of Credit;

(ii) in cases where there is single source of supply only and where the practice of paying advance is already in vogue as a standard practice;

(iii) in cases of purchase during natural calamities and emergencies declared by the Government under clause (a) of section 16 of the Act;

(iv) in cases of purchase of life saving drugs; and

(v) in cases where the standard commercial terms of supply require payment of advance by the Procuring Entity, such as the machinery and equipment manufacturers for sugar and cement plants.]

(b) Mobilization advances may be paid in the case of construction or supply and installation contracts of a large and complex nature, for a value exceeding rupees one crore:

Provided that such mobilization advances shall not ordinarily exceed ten per cent of the value of the contract, shall be secured against irrevocable bank guarantee and shall be recovered in the subsequent bills payable along with interest as per specific terms set in the tender documents

Provided further that in case of mobilisation advances for plant machinery and equipment, they are also hypothecated to the Governor of Tamil Nadu in addition to other requirements;

(c) Percentage of payment to be withheld for the effective performance of the contract:

Provided that withheld amounts do not exceed ten per cent of the total value of contract;

(d) Payment terms for imports shall be based on standard terms of international trade and the payment may be effected through irrevocable Letters of Credit drawn on banks;

(5) The tender documents shall clearly indicate whether any variations in the commercial terms prescribed in the documents will be permitted and if so to what extent such variations would be considered.

(6) The tender documents and the contract shall include a clause for payment of liquidated damages and penalty payable by the tenderer in the event of non-fulfillment of any or whole of the contract.

(7) The tender documents shall clearly indicate the terms on

which the tenderers will be required to quote their [19][financial bid] which should be inclusive of all costs of delivery at the final destination such as transportation, payment of duties and taxes leviable, insurance and any incidental services and giving the break up thereof.

[20] & [21][(7-A) The tender documents shall include then details of purchase preference as provided in the Chapter VI-A.]

(8) The tender documents shall include a price adjustment clause to reflect any changes either upward or downward in major cost components such as labour, equipment, material and fuel, based on a prescribed formula in the case of large contracts where the period of execution is likely to exceed eighteen months.

(9) The tender documents shall indicate the quantity proposed to be procured in the tender, and the Tender Accepting Authority shall be ordinarily permitted to vary the quantity finally ordered only to the extent of twenty five percent either way of the requirement indicated in the tender documents.

15. **Tender documents to clearly specify evaluation criteria.-** (1) The tender documents shall clearly indicate the criteria [22][including financial bid] which are to be adopted for evaluating the tenders and how such criteria will be quantified or evaluated; and

[23][(2) The qualification criteria in terms of the registration of contractors in the cases where the Procuring Entity has a system of registration of contractors, the required experience, available manufacturing and construction capacity, technical and other manpower and financial status shall be clearly stated in the tender documents.]

16. **Supply of Tender Documents.-** (1) The Tender Inviting Authority shall make available the tender documents [24][from the date of publication of the Notice Inviting Tenders].

[25][(2) The Tender Inviting Authority shall ensure that the tender documents are made available to any person who is willing to remit the cost of such documents.]

[26][(3) (a) The tender documents shall be made available at:-

(i) the office of the Tender Inviting Authority;

(ii) any other office or place indicated by the Procuring Entity.

(b) In respect of procurement where the estimated value of procurement is [Rupees Twenty Five Lakhs and above in value for construction and Rupees Ten Lakhs and above in value for other categories of procurement inclusive of consultancies for construction], the tender document shall be made available for downloading free of cost at the website designated for this purpose by the Government. Tender documents may also be made available free of cost at such other websites as may be indicated by the Tender Inviting Authority.]

(4) The Tender Inviting Authority shall send by registered post or courier the tender documents to any prospective tenderer who makes a request for the documents on payment of cost along with postal charges at the risk and responsibility of the prospective tenderer.

17. **Clarification to Tender Documents.-** [27][(1) At any time after the issue of the tender documents and before the opening of the tender, the Tender Inviting Authority may make any changes, modifications or amendments to the tender documents and shall send intimation of such change to all those who have purchased the original tender documents and upload corrigendum for the information of those who have downloaded the tender documents from the website.]

[28][(2) In case any tenderer asks for a clarification on the tender documents before 48 hours of the opening of the tender, the Tender Inviting Authority shall ensure that a reply is sent and copies of the reply to the

clarification sought shall be communicated to all those who have purchased the tender documents without identifying the source of the query and upload such clarification to the designated website for the information of those who have downloaded the tender documents from the website, without identifying the source of the query.]

CHAPTER-V.

RECEIPT OF TENDERS AND TENDER OPENING.

18. **Place and time for receipt of tenders.-** [29][(1) The Tender Inviting Authority shall ensure that adequate arrangements are made for the proper receipt and safe custody of the tenders at the place indicated for the receipt of tenders. Such of the tenders that are received through electronic mail shall be kept electronically locked.]

(2) The Tender Inviting Authority shall take all measures to ensure that no intending tenderer is hindered in submitting his tender.

[30][(3) The Tender Inviting Authority shall permit the submission of tenders by post or courier or by electronic submission through the designated website, wherever applicable:

Provided that the Tender Inviting Authority shall not be responsible for any delay in transit in such cases.]

(4) The Tender Inviting Authority shall not accept any tenders submitted by facsimile (fax) [31][...].

(5) The Tender Inviting Authority may extend the last date and time for receiving tenders [32][which shall be published on the designated website also] after giving adequate notice to all intending tenderers in cases where.-

(a) the publication of the tender notice has been delayed;

(b) the communication of changes, in the tender documents to the prospective tenderers under sub-rule (1) of rule 17 took time;

(c) any of the tenderers requested clarifications, the communication of which took time to all the tenderers; and

(d) any other reasonable grounds exist, for such extension which shall be recorded in writing by the Tender Inviting Authority.

33[(e) in the case of tenders not submitted electronically, the tenderer shall ensure that all the pages are serially numbered and the submitted tender documents are properly stitched and bound.]

19. **Marking of covers in which the tender is submitted.-** The tenderer shall be responsible for properly superscribing and sealing the cover in which the tender is submitted and the Tender Inviting Authority shall not be responsible for accidental opening of the covers that are not properly superscripted and sealed as required in the tender documents before the time appointed for tender opening.

20. **Minimum time for submission of tenders.-** (1) The Tender Inviting Authority shall ensure that adequate time is provided for the submission of tenders and a minimum time is allowed between date of publication of the Notice Inviting Tenders in the relevant Tender Bulletin or in the newspapers whichever is later and the last date for submission of tenders. This minimum period shall be as follows.-

(a) for tenders upto rupees two crores in value, fifteen days; and

(b) for tenders in excess of rupees two crores in value, thirty days.

(2) Any reduction in the time stipulated as per sub-rule (1) has to be specifically authorized by an authority superior to the Tender Inviting Authority for reasons to be recorded in writing.

34[**20-A. Withdrawal of Tenders Before Opening:-** (1) No tenderer shall be allowed to withdraw the tenders after submitting the tender.

(2) A Tenderer may submit a modified tender before the last date for receipt of tender:

Provided that where more than one tender is submitted by the same tenderer, the lowest eligible financial tender shall be considered for evaluation.]

21. **Opening of Tenders.-** (1) All the tenders received by the **35**[Tender Inviting Authority] shall be **36**[opened at the time and venue] specified in the Notice Inviting Tenders and in cases where an extension of time for the submission of tenders has been given subsequent to the original Notice Inviting Tenders in accordance with sub-rule (5) of rule 18 at the time so specified subsequently. **37**[The e-submitted tenders may be permitted to be opened by a Tender Inviting Authority or a member of the Tender Scrutiny Committee from their new location if they are transferred after the issue of Notice Inviting Tender and before tender opening and where the new incumbent is yet to obtain his digital signature certified.]

(2) The time specified for the opening of tenders shall be immediately after the closing time specified for the receipt of tenders allowing a reasonable period, not exceeding one hour, for the transportation of the tenders received to the place they are to be opened in the presence of the tenderers who choose to be present.

(3) The tenders will be opened in the presence of the tenderers or one representative of the tenderer who chooses to be present.

22. **Procedure to be followed at tender opening.-** The following procedure shall be followed at the tender opening.-

38[(a) All the envelopes containing tenders and the tenders received through the electronic mail in the designated website shall be counted.]

(b) All the tenders received in time shall be opened.

39[(c) Any tender received subsequently shall not be opened and shall

be returned unopened to the tenderer and in the case of tenders submitted through electronic mail in the designated website, a report on the late submission of tenders shall be generated and the same shall be sent to the tenderers concerned.];

(d) On opening of the tender, the members of the Tender Scrutiny Committee shall initial the main bid including the prices and any corrections;

(e) A record of the corrections noticed at the time of the bid opening shall be maintained;

(f) The name of the tenderers and the quoted prices should be read out aloud.

(g) the fact whether earnest money deposit has been submitted and other documents required produced may be indicated, but this shall be merely an examination of the documents and not an evaluation;

(h) Minutes of the tender opening shall be recorded.[40][…]

[41][(i) The signatures of all the tenderers present shall be obtained and if any of the tenderers or his representative refuses to sign the minutes, the same shall be recorded.]

23. **Changes and alterations not to be permitted after tender opening.-** No changes, amendments which materially alter the tendered prices shall be permitted after the opening of the tender, except as per the procedure prescribed in sub-section (3) of section 10 of the Act.

24. **Tender Scrutiny Committee.-** (1) A Tender Scrutiny Committee may be constituted to scrutinize the tender documents, supervise opening of tenders, to carry out the preliminary examination and detailed evaluation of the tenders received and to prepare an evaluation report for the consideration of the Tender Accepting Authority.

(2) The constitution of a Tender Scrutiny Committee will be obligatory in all cases where the value of the procurement exceeds limit as may be specified.

CHAPTER-VI.

TENDER EVALUATION.

25. **Tender evaluation to be in accordance with evaluation criteria.-** The Tender Accepting Authority shall cause the evaluation of tenders to be carried out strictly in accordance with the evaluation criteria indicated in the tender documents.

26. **Time taken for evaluation and extension of tender validity.-** (1) The evaluation of tenders and award of contract shall be completed, as far as may be practicable, within the period for which the tenders are held valid.

(2) The Tender Accepting Authority **42**[may] seek extension of the validity of tenders for the completion of evaluation:

43[Provided that sum total of all extensions shall ordinarily not exceed 180 (one hundred and eighty) days.]

(3) In case the evaluation of tenders and award of contract is not completed within extended validity period, all the tenders shall be deemed to have become invalid and fresh tenders may be called for.

27. **Process of tender evaluation to be confidential until the award of the contract is notified.-** (1) Subject to the provision of **44**[sections 13 and 14 of the Act], the Tender Inviting Authority shall ensure the confidentiality of the process of tender evaluation until orders on the tenders are passed.

(2) The Tender Accepting Authority shall cause the information on orders passed on the tenders published in the Tender Bulletin.

(3) Tenderers shall not make attempts to establish unsolicited and unauthorized contact with the Tender Accepting Authority, Tender Inviting Authority or Tender Scrutiny Committee after the opening of the Tender and prior to the notification of the Award and any attempt by any

tenderer to bring to bear extraneous pressures on the Tender Accepting Authority shall be sufficient reason to disqualify the tenderer.

(4) Notwithstanding anything contained in sub-rule (3), the Tender Inviting Authority or the Tender Accepting Authority may seek bonafide clarifications from tenderers relating to the tenders submitted by them during the evaluation of tenders.

28. **Initial examination to determine substantial responsiveness.-** (1) The Tender Inviting Authority shall cause an initial examination of the tenders submitted to be carried out in order to determine their substantial responsiveness.

(2) The initial examination shall consider the following factors, namely:-

(a) Whether the tenderer meets the eligibility criteria laid down in the tender documents;

45[(b)(i) Whether the crucial documents have been duly signed;

(ii) Whether the documents have been authenticated by digital signature, in the case of tenders submitted through electronic mail in the designated website.]

(c) Whether the requisite Earnest Money Deposit (EMD) has been furnished;

(d) Whether the tender is substantially responsive to the technical specifications, commercial conditions set out in the bidding documents including the testing of samples where required.

(3) Tenders which on initial examination are found not to be substantially responsive under any of the clauses under sub-rule (2) may be rejected by the Tender Accepting Authority.

29. **Determination of the lowest evaluated price.-** (1) Out of the tenders found to be substantially responsive after the initial examination,

the tenderers who has bid the lowest evaluated price in accordance with the evaluation criteria or the tenderers scoring the highest on the evaluation criteria specified as the case may be shall be determined.

(2) In determining the lowest evaluated price, the following factors shall be considered, namely:-

(a) the quoted price shall be corrected for arithmetical errors;

(b) in cases of discrepancy between the prices quoted in words and in figures, lower of the two shall be considered;

(c) adjustments to the price quoted shall be made for deviations in the commercial conditions such as the delivery schedules and minor variations in the payment terms which are quantifiable but deemed to be non-material in the context of the particular tender;

46[(d) the evaluation shall include **47**[State Goods and Services Tax, Central Goods and Services Tax, Integrated Goods and Services Tax, and all central duties such as customs duty] as a part of the price, as detailed below: -

(i) in evaluation of the price of an imported item, the price has to be determined inclusive of the customs duty;

(ii) in evaluation of the price of articles which are subject to **48**[State Goods and Services Tax, Central Goods and Services Tax, Integrated Goods and Services Tax], the price has to be determined inclusive of such **48**[State Goods and Services Tax, Central Goods and Services Tax, Integrated Goods and Services Tax];

49[(iii) and (iv) …]

(e) in the case of purchase of equipment, the operation and maintenance and spare part costs for appropriate periods as may be specified in bid documents may be quantified, where practicable and considered.

50(f) **51**[...]

(2) In order to secure the best possible procurement price, negotiations with tenderer determined as per [52][sub-rules (1) and (2) of this rule] are permissible subject to provisions in section 10 of the Act.

[53][(4) In the event that two or more tenderers have made the same financial bid and the splitting of the tender is not possible in accordance with sub-section (5) of section 10 of the Act, the Tender Accepting Authority shall identify the lowest tenderer by adopting one of the following approaches, which shall be pre-specified in the Tender Documents:

(a) In case of multi-stage tenders, by taking into account the qualification score of each tenderer from the first stage and the tenderer with higher score shall be adjudged the Lowest Tenderer; or

(b) By asking the two tenderers to provide their best and final offer of the financial bid in a sealed cover and the tenderer offering the most advantageous financial bid shall be adjudged the Lowest Tenderer.

(c) In case, a tie still persists after the procedure contained in clause (a) or (b) of this sub-rule has been followed, the selected tenderer shall be identified by draw of lots, which shall be conducted, with prior notice, in the presence of the tied tenderers or their representatives who choose to be present.]

[54][29-A. Treatment of Speculative Tenders.- (1) The Tender Accepting Authority may reject a tender, if it has determined that the financial bid in combination with other constituent elements of the tender is abnormally low or abnormally high in relation to the subject matter of the procurement and raises concerns with such authority as to the ability of the tenderer to perform the contract.

(2) Before arriving at a determination under sub-rule (1), the Tender Accepting Authority may in writing seek such other information from the tenderers as it considers relevant.

(3) The decision of the Tender Accepting Authority to reject a

submission in accordance with this rule and the reasons for that decision, and all communications with the tenderer under this rule shall be included in the record of the Tender Proceedings.

(4) The decision of the Tender Accepting Authority and the reasons therefor shall be promptly communicated to the tenderer concerned.]

30. Preparation of Evaluation Report and Award of Tenders.- (1) The Tender Scrutiny Committee or the officer evaluating the tender shall prepare detailed evaluation report which shall be considered by the Tender Accepting Authority before taking a final decision on the tender.

(2) The evaluation report shall be prepared in the standardized format as may be prescribed.

(3) As soon as the tenderer qualified to perform the contract is identified, in accordance with section 10(6) of the Act, the Tender Accepting Authority shall pass orders accepting the tender and communicate the order of acceptance to the successful tenderer. The Tender Accepting Authority will also send to the Tender Bulletin Officer a statement of evaluation of the tenders with a comparative statement of tenders received and decision thereon for publication in the Tender Bulletin.

(4) Within such reasonable time as may be indicated in the tender documents, the tenderer whose tender has been accepted will be required to execute the contract agreement in the prescribed format.

(5) In case the successful tenderer fails to execute necessary agreements as prescribed within the period specified, then his Earnest Money Deposit (EMD) shall be forfeited and his tender held as non-responsive.

[55]CHAPTER VI-A

PURCHASE PREFERENCE

30-A. Purchase preference to domestic enterprises.- In case of procurement of goods or services, where it is possible for the procuring entity to divide the award of tenders to more than one supplier or service provider, the tender document shall clearly indicate that up to twenty five per cent of the total requirement in the procurement may be awarded to domestic enterprise, not being the lowest tender, in respect of only of goods manufactured or produced or services provided or rendered by them, if the following conditions are satisfied:

(a) the lowest tender is not a domestic enterprise;

(a) the preferential award shall extend only to the lowest tender among the domestic enterprises who are substantially responsive and technically qualified; and

(b) such domestic enterprise is willing to match the price of the lowest tender:

Provided that where the Tender Inviting Authority is of the view that in the interest of the participation of domestic enterprise in the tender to avail the above benefit, a less stringent set of technical qualification parameters are required, he shall specify a separate set of technical qualifications for domestic enterprises in the tender documents with the approval of the Government.

30-B. Purchase preference to Government departments, Public Sector Undertakings, Statutory Boards and other similar institutions.- In case of procurement of goods or services, where it is possible for the procuring entity to divide the award of tenders to more than one supplier or service provider, the tender document shall clearly indicate that up to forty per cent of the total requirement in the procurement may be awarded to Government departments, Public Sector Undertakings, Statutory Boards and other

similar institutions as may be notified by the Government, in respect of only of goods manufactured or produced or services provided or rendered by them, if such tenderer is willing to match the price of the lowest tender.]

CHAPTER-VII.

EVALUATION AND AWARD OF TENDERS IN SPECIAL CASES.

31. **Procurement in Special Cases.-** In the case of purchase of goods where the quantity offered at the lowest price is less than the total quantity required, the Tender Accepting Authority may, after placing orders with the lowest evaluated tenderer for the entire quantity offered by such tenderer subject to his ability to supply, adopt either or both of the following procedures to procure the balance quantity.-

(1) Negotiate with the next lowest tenderers in strict ascending order of evaluated price and require them to match the price offered by the lowest evaluated tenderer and place orders until the entire quantity required is ordered; or

(2) Require all the other eligible tenderers who participated in the tender and offered a price higher than that offered by the lowest evaluated tenderer, to submit sealed offers of the quantity they would be willing to supply at the price quoted by the lowest evaluated tenderer, and thereafter place orders for the remaining required quantity with all those who match the lowest evaluated price such that those who bid lower prices in the original tender get a higher priority for supply.

(3) In case the bidders other than the lowest evaluated bidder fail to agree to accept the lowest price or the total quantity offered by them at the price quoted by the tenderer with lowest evaluated price is less than the required quantity, the Tender Accepting Authority may place orders for remaining required quantity at different rates with different suppliers in the ascending order of evaluated price until the entire quantity required is

covered:

Provided that, where different quantities have to be procured at more than one price from one or more tenderers, the Tender Accepting Authority may decide not to procure beyond a price considered economical although the entire quantity originally stated to be required in the tender documents is not ordered.

(4) In cases where, the Tender Accepting Authority such as Tamil Nadu Electricity Board, Tamil Nadu Civil Supplies Corporation, Project Director, Integrated Child Development Scheme (ICDS) **56**[and Tamil Nadu State Transport Corporations] is of the view that the commodity to be purchased is so vital in nature and the failure in supply would affect the public interest and that it is necessary to have more than one supplier, the Authority may place orders on the tenderer quoting the lowest evaluated price for not less than 60% of the quantity covered in the tender at the price quoted by him and place orders for the remaining quantity on the tenderers quoting the next lowest evaluated prices at the lowest evaluated price and shall specify this in the tender documents.

57[Provided that the commodity to be purchased by the Tamil Nadu State Transport Corporations shall be restricted to bus chassis only].

58[**31-A. Fixed Rate Contract.-** (1) In cases where the prices offered by the Lowest Tenderer are in the opinion of the Tender Accepting Authority higher than the schedule of rates or the prevailing market price and the quantity of goods or services to be procured are of such volume or are required to be delivered at different locations or at different points in time such that it is not practical for the entire supply to be effected by only one or a few suppliers, such authority may for reasons to be recorded in writing and after obtaining the prior approval of Government, follow the fixed rate contract procedure.

(2) The rates for the supply of the goods or services will be determined through a process which shall include the following steps:-:

(a) Open tenders shall be or shall have been called from all eligible tenderers and the rates quoted shall be taken into consideration;

(b) The rates quoted by the eligible Lowest Tenderer in the open tender shall be compared with the prevailing market rate and the rates of the previous period and if the Tender Accepting Authority is of the view that the quoted rates are too high, the Authority may negotiate with the Lowest Tenderer to ascertain whether further reduction in rates is possible;

(c) If after negotiations, the Tender Accepting Authority is of the view that the rates are still too high with reference to rates of the previous period or prevailing market rates, the Tender Accepting Authority may after considering relevant factors, determine and notify an appropriate rate, as the fixed rate.

(d) All eligible suppliers who accept the fixed rate shall be enlisted by the Procuring Entity for delivery of services.

(e) Where the Procuring Entity deems fit, it may issue an advertisement indicating the rates fixed and call for enrollment of more suppliers at these rates subject to such suppliers fulfilling the eligibility criteria.

(f) Orders for supply of goods or services from the enlisted suppliers shall be placed on the basis of transparent criteria to be indicated in the tender documents or advertisement as the case may be, and shall inter alia, include the capacity to supply, past performance of the suppliers where applicable, and giving due priority to the supplier or suppliers who participated in the initial tender and offered the lowest rate.]

32. [59][**Pre-qualification Procedure in a single stage, two cover system**].- (1) The Tender Inviting Authority shall for reasons to be recorded in writing provide for pre-qualification of tenderers on the basis of,-

(a) experience and past performance in the execution of similar contracts;

(b) capabilities of the tenderer with respect to personnel, equipment and construction or manufacturing facilities;

(c) financial status and capacity

(2) Only the bids of pre-qualified bidders shall be considered for evaluation.

60[**32-A. Pre-qualification with Multi-stage Tendering.-** (1) A Procuring Entity may invoke the multi-stage tendering process in cases where:

(a) The Procuring Entity assesses that discussions with tenderers are needed to refine aspects of the description of the subject matter of the procurement and to formulate them with precision in order to allow the Procuring Entity to obtain the most satisfactory solution to its procurement needs; or

(b) the successful tenderer is expected to carry out a detailed survey or investigation and undertake a comprehensive assessment of risks, costs and obligations associated with the particular procurement; and

(c) in any other case for reasons to be recorded in writing.

(2) Where the Procuring Entity invokes the multi-stage tendering process, the Tender Inviting Authority shall call for initial submissions containing their applications or proposals without a financial bid, containing the following items, namely:-

(a) proposals relating to the technical, quality or performance characteristics of the subject matter of the procurement;

(b) contractual terms and conditions of supply:

(c) where relevant, the professional and technical competence, experience and qualifications of the tenderers.

(3) The Tender Accepting Authority may, in the first stage, engage in discussions with eligible tenderers concerning any aspect of their initial proposals:

Provided that when the Tender Accepting Authority engages in discussions with any tenderer, it shall extend equal opportunity to all eligible tenderers to participate in discussions.

(4) At the conclusion of the first stage, the Tender Accepting Authority shall pre-qualify the tenderers that fulfill the eligibility criteria, and promptly notify each tenderer whether or not it has been pre-qualified and shall upon request communicate to the tenderers that have not been pre-qualified the reasons there for:

Provided that if the Tender Accepting Authority is of the view that the number of pre-qualified Tenderers is too small to have an effective competition, the authority may decide not to proceed further with the Tender.

(5) In the second stage, the Tender Accepting Authority shall invite financial tenders from the pre-qualified and short-listed tenderers.

(6) The final tenders received under sub-rule (5) shall be evaluated in order to ascertain the lowest evaluated tenderer in accordance with these rules.]

33. **Low Value Procurement.-** [61][For the purposes of clause (d) of section 16 of the Act, „Low Value Procurement" means any procurement, which is less than **rupees twenty five lakhs in value for construction**, which is less than **rupees twenty lakhs in value for vehicles** and which is less than **rupees ten lakhs in value for all other categories of procurement** inclusive of consultancies for construction.]

62[THE ANNEXURE

[See rule 11 (2)]

1. Financial limits for advertising Tender Notices in

Details of Newspaper			Value of Procurement	
Area	**English**	**Tamil**	**Goods/ Services**	**Works**
[1]	**[2]**	**[3]**	**[4]**	**[5]**
District	**Nil**	**1** (District edition)	Above Rs.10 lakh and upto Rs.25 lakh	Above Rs.25 lakh and upto Rs.50 lakh.
State	**1** (All editions in the State)	**1** (All editions in the State)	Above Rs.25 lakh and upto Rs.3 crore.	Above Rs.50 lakh and upto Rs.3 crore.
South India	**1** (South India edition)	**1** (All editions in the State)	Above Rs.3 crore and upto Rs.5 crore.	Above Rs.3 crore and upto Rs.5 crore.
All India	**1** (All India edition)	**1** (All editions in the State)	Above Rs.5 crore and upto Rs.75 crore.	Above Rs.5 crore and upto Rs.75 crore.
	1 (All India edition and Indian Trade Journal)	**1** (All editions in the State and Indian Trade Journal)	Above Rs.75 crore.	Above Rs.75 crore.

newspapers are as follows:

2. Conditions for publication of tender advertisements:-

(a) When more than one tender is bunched in a tender notice, the highest value among the individual tenders should be considered to determine the applicable norms. The sum total of values of all individual tenders cannot be considered; and

(b) In the case of international competitive biddings, it would be open for the tender inviting authority to give additional advertisements in more number of newspapers or magazines.]

3.4 TENDER

3.4.1 TENDER NOTICE

1. Sealed Tenders will be received up to ..... A.M./P.M. on the ..... of 19...

by the Executive Engineer.....Division for the following work :-

Name of work ..... Estimated cost Rs. ……..

2. The work must be completely finished to the satisfaction of the Executive Engineerwithin .....months from the date of the order to commence thework.

3. The Tender Form with complete sets of blank forms of contract can be obtained from theoffice of the Executive Engineer ..... Divisions at.....every

day (except Sunday and holiday) from ……..A.M. to …… P.M. at a charge ofRs .....per set.

4. Each tender must be accompanied by a deposit of Rs. ……. as earnestmoney. Such earnest money may be of the following forms :-

(i) Cash or Treasury Challan.

(ii) Post office savings bank pass-book having the requisite amount in the account, pledged tothe Executive Engineer.

(iii) Deposit Receipt of State Bank or other approved Bank pledged to the Executive Engineer.

(iv) National plan loan or National Saving Certificate pledged to the Executive Engineer.

5. The tenders will be opened at..... A.M./P.M. on the…… day 19.....

by the Executive Engineer or his authorized agent at the office at ……

6. Power is reserved to reject any tender or all tenders without assigning any reason or givenany explanation.

7. Unless the person, whose tender has been accepted, signs the contract and deposits thesecurity specified within ..... days, the earnest money deposited by him will be forfeited and theacceptance of his tender will be withdrawn.

8. The tendered rates shall be for the complete work and shall include all quarrying charges,royalty, testing, screening, tools and plants, carriage of materials to site, removal and changes ofrejected materials, all taxes, income-tax, sales-tax, octroi charges, materials, labour, etc.

9. The tender rates will remain valid for a period of three months from the date of openingtenders.

10. The quantities in the bill of quantities are approximate and liable to variation or

cancellation for which contractor will not be entitled to any compensation. The quantities of anyitem or items and the total cost may vary by 20% for which rates shall not be altered.

11. The rate should be quoted in the bill of quantities, legibly both in figures and words.

Executive Engineer .....Division

3.4.2 TYPES OF TENDER

the tenders can be classified into the following three categories.

(i) Open or Public Tender

(ii) Selected (or) Limited Tender

(iii) Negotiated Tender

1. Open or Public Tender

Open or public tender may be defined as the one, in which any contractor canenter into the competition and all formalities of giving opportunity to compete areto be fulfilled. It is compulsory for the public works and because of competition; itmay result in low cost. But there are chances of dispute as mistakes found out at alater stage are difficult to be adjusted. These open tenders are not suitable forcomplicated and specialized jobs.

It is also a laborious work for an engineer, because of the work may have to beentrusted to an unknown contractor. The end result is likely to be that the workgoes to contractor, who is not suitable for the work and even though the initialprice is low, the final cost (including the cost for delays, claims, excessive items,non-tender items, etc.) is likely to be higher.

II. Selected or Limited Tender

For this type of tender, the architect/engineer after consultation with his clientinvites a limited number of contractors for filling up the tender of project. It resultsinto competition on a small scale. However, it proves to be useful for complicatedand skilled works. It also leads to the early successful completion of the project.

III. Negotiated Tenders

This tender is the advanced form of selective tender and the contract is given bynegotiations with one or at the most two contractors. There is no competition inthistype of tender and hence it may be a costliest one. When the work is to becompleted in target time without sacrificing for the quality, the negotiated tendermay prove to be the alternative only.

3.4.3 TENDER PROCEDURES

The tendering process in construction includes the following stages:

1. Pre-tender Stage
2. Tender Advertisement Stage

3. Closing of Tender
4. Tender Opening Process
5. Tender Evaluation Process
6. Tender Award

1. Pre-tender Stage

At the pre-tender stage, when the clients have an idea, the client will appoint aconsultantto discuss further the project. The consultant will do their job, advising, managing the tender and contract, and also transferring the idea into the drawing.

At this stage, the client and consultants will be brainstorming about the scope, time to complete, and budget.

The pre-tender stage is the most crucial matter because it will initiate the next step of a project. If the pre-tender stage is failed, the project will not complete. it is the first stage or step for the tendering process in construction.

2. Tender Advertisement Stage

The tender advertisement is also called tender notice. The conventional tender notice will advertise in the local newspaper. In the tender notice, the basic requirement that should be appearing are:

- Title of the project.
- Class of contractor, head, and subhead needed.
- Location, date, and time to obtain the tender document.
- Fees for tender documents.
- Location, date, and time for submission of tender doc.

3. Closing of Tender

Tender notice will mention the time and date of the tender closing process.

If the contractors fail to submit their bids within a specific time and date, it considers the contractors refuse to bid for the tender. At that time also the tender validity period is started.

At this stage, contractors can withdraw back their tender papers if they are no more interested to fight for the tender. Consultants use this period to make assessments and evaluations of each of the offers.

4. Tender Opening and Evaluation Process

Quantity surveyors usually will handle the tender opening process. To ensure the integrity of the competitive process, the evaluation of proposals must be undertaken objectively, consistently & without bias towards particular suppliers.

Tenders are generally evaluated against a pre-determined set of criteria. The evaluation of the tenders shall be prepared the soonest as possible after the tender opening.

A report prepared by the Quantity Surveyor will describe the findings of the said evaluation and it will be supported by tables and graphs. In the end, the Quantity Surveyor will recommend which tenderer, who in his opinion, is the most suitable to undertake to execute the project.

5. Tender Award

An evaluation team will examine each tender received and make recommendations as to which tender represents the best value for money. Once the *contract* has been finalized and work has been awarded, both the successful and unsuccessful tenderers will be notified.

Once the final decision has been made on the tender award to the particular contractor, the tender administrator creates the tender results notification which is in letter form and then sent to all participating contractors.

Once the client or government accepts a tender, it is binding on both parties. This means that the agency or company that won the tender has to provide the goods or services in the manner agreed to and at the price offered, and the client/government must pay the agreed price at the agreed time. The tendering process in construction is complete with tender awarding.

3.4.4 E-TENDERING

E-Tender is defined as the form of tender made by using computer networks. Aninternet based process where in the complete tendering process are carried out by using online is called E-tendering.

3.4.5 DIGITAL SIGNATURE CERTIFICATES

Digital Signature Certificates (DSC) are the digital equivalent (that is electronic format) of physical or paper certificates. Examples of physical certificates are drivers' licenses, passports or membership cards. Certificates serve as a proof of identity of an individual for a certain purpose; for example, a driver's license identifies someone who can legally drive in a particular country. Likewise, a digital certificate can be presented electronically to prove your identity, to access information or services on the Internet or to sign certain documents digitally.

3.4.6 ENCRYPTING AND DECRYPTING

Encryption is the process by which a readable message is converted to an unreadable form to prevent unauthorized parties from reading it. Decryption is the process of converting an encrypted message back to its original (readable) format. The original message is called the plaintext message.

To change electronic information or signals into a secret code (= system of letters, numbers, or symbols) that people cannot understand or use on normal

equipment: Your financial information is fully encrypted and cannot be accessed. Codes & decoding.

3.4.7 REVERSE AUCTIONS

A reverse auction is a type of auction in which sellers bid for the prices at which they are willing to sell their goods and services. In a regular auction, a seller puts up an item and buyers place bids until the close of the auction, at which time the item goes to the highest bidder. In a reverse auction, the buyer puts up a request for a required good or service. Sellers then place bids for the amount they are willing to be paid for the good or service, and at the end of the auction the seller with the lowest amount wins.