



(i) **Brief specification of a first class single storey building:**

- **Foundation and Plinth:** Foundation and plinth shall be of first class brickwork in cement mortar 1:6 over cement concrete 1 : 4 : 8.
- **Damp Proof Course:** 25 mm thick cement concrete 1 : 1.5 : 3 mixed with one kg of water proofing compound per bag of cement.
- **Superstructure:** It shall be of first class brickwork with cement mortar 1:6. Lintels over door shall be of R.C.C 1 : 2 : 4 as per drawing.
- **Roofing:** R.C.C slab 1 : 2 : 4 machine mixed. Top of the roof should be plastered with 1 : 4 mortar with neat cement punning. Reinforcement should be as per the drawing.
- **Flooring:** Vitrified tiles 2' x 2' in drawing room, kitchen and bed rooms. Ceramic tiles in bathrooms and balconies over cement concrete 1 : 2 : 4.
- **Finishing:** All walls should be 12 mm thick 1:6 cement plaster. Ceiling should be plastered with 1 : 4 cement mortar. All walls and ceiling should be finished with OBD over POP.
- **Doors and Windows:** All doors and window chowkats should be of seasoned sal wood. Internal doors shall be made of painted flush shutters of ply board. Main entry door and window shutters shall be teak wood paneled glazed. All fittings should be of brass. Doors and windows shall be painted two coats with a coat of primer.
- **Toilets:** White sanitary ware with EWC, CP fittings. Plumbing shall be concealed with CPVC pipes.
- **Electrical:** Copper wire in PVC conduits with MCB supported circuits. Adequate number of power and light points. All electrical fittings shall be BIS marked.

(ii) **Detailed specification:** Detailed specification describes about the quantity, quality and proportion of materials to be used in a particular item of the work. It also include the method of preparation, execution and method of measurement. The detailed specifications of different items of work are prepared separately in such a manner that it should describe what the work is, how they shall be executed and constructed. It also specifies the type of machinery, equipments; special tools and plants required for the project. The detailed specification is always written in the sequence in which the work is to be carried out. It forms the part of the tender document.

Detailed specification for various items of work are prepared by the engineering department of an organization and are printed in a booklet form, known as standard specification. These standard specification once prepared can be used for other projects which saves lot of man power and cost.

### 9.7.4 Detailed Specification of Various Items of Work

#### 1. Earthwork in Excavation in Foundation:

- The excavation for the foundation trench shall be carried out to exact depth and width of the foundation concrete. The sides of the trench shall be vertical and the bottom shall be leveled uniformly.
- The excavated earth shall be stacked atleast 2 m away from the outer edges of excavation.
- If rocks or rocky soils are found during excavation, these should be removed and bed of trench should be leveled.
- Water accumulated in the trench shall be bailed or pumped out and necessary precaution shall be taken to avoid collapse of sides of the trench.

(i) **Finishing - Inside and outside**

The inside of drawing, dining and bed rooms shall be distemppered and remaining portions white - washed three coats.

(ii) **Doors & Windows - Doors & Windows frames shall be of seasoned teak**

- Before laying of concrete, subgrade shall be made rough, cleaned and well watered. It shall then be given cement wash. Concrete placed gently and compacted to the required thickness. The surface shall be smoothed with wooden or aluminum float. Any unevenness shall be removed by using 1 : 2 cement mortar and dry cement shall be spread over the fresh concrete and polished. The concrete shall be allowed to set for 24 hrs and then curing shall be done by flooding the concrete for at least 7 days. Same brand of cement is used for the concrete for the entire floor to get uniform colour.
- Cement concrete flooring is measured in sq.m.

#### 8. Vitrified Tiled Floor:

- The tiles shall be of approved make and shall conform to the approved standards. They shall be free from cracks, crazing spots, chipped edges and corners. The shape, size and thickness strength of tiles shall be as per the requirement of tender documents. The tiles shall conform to the relevant standards in all respects. Samples of tiles shall be got approved from the Engineer-in-charge before bulk procurement.
- Sub-grade concrete or RCC slab on which tiles are to be laid shall be scratched, cleaned and well watered. Cement mortar for bedding shall be prepared of mix 1:4 by volume of fresh cement and clean sand or as specified in the schedule of items. The mortar shall be of workable consistency. Care shall be taken in preparation of the mortar to ensure that there are no hard lumps that would interfere with even bedding of the tiles. The freshly prepared mortar of specified proportion and thickness shall then be evenly and smoothly spread over the base to proper level or slope and allow it to harden sufficiently to provide a fairly good cushion for the tiles to set.
- The tiling work shall be done as per the pattern shown in the drawing or as directed by the Engineer-in-Charge. Laying of tiles shall be commenced from the centre of the area and advanced towards the walls, as a general practice. Cut tiles, if any, shall be laid along wall as shown in the drawing or as directed by the Engineer-in-Charge. Adhesive cement slurry to the back of the tile shall be applied to ensure proper and full bedding. The tiles shall be then laid on the bedding mortar. Tiles shall then be well pressed and gently tapped with a wooden mallet till it is properly bedded and in level with the adjoining tile. Do not use an iron hammer or some heavy material to press tiles. There shall be no air gap between the tile and bedding mortar. The joints shall be kept as close as possible and in straight line. The joint shall be filled with white/ matching colour cement slurry. After filling the joints after 15 mins. The flooring shall be covered with wet sand and allowed undisturbed for 14 days. Once the floor has set, the floor shall be carefully washed clean and dried.
- Vitrified tile floor shall be measured in sq.m.

#### 9. Distemping:

- Oil bound distemper of approved brand and colour shall be used.
- The surface shall be prepared by applying cement based putty to the entire area to get uniform and smooth surface. Surface so prepared shall be rubbed with sand paper and cleaned by dry cloth to get smooth finish.
- The distemper primer shall be applied to the prepared surface and allowed to dry for 48 hours.
- Before applying distemper, the surface shall be lightly rubbed with sand paper to make it smooth for receiving the oil bound distemper, taking care not to rub out the

9) Finishing - Inside and outside shall be 12 mm thick cement plastered as per the inside of drawing, dining and bed rooms shall be distempred and remaining portions white - washed three coats.

10) Doors & Windows - Doors & Windows frames shall be of seasoned teak wood

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## SPECIFICATIONS

### 1.1 Specification

A specific description of any subject is known as specification. In engineering, specification provides information regarding the nature and the class of work, quality of the materials to be used in work and its workmanship. Drawings of any work do not furnish the quality of materials to be used in work. Both drawings and specifications form the important part of tender document.

### 1.2 Necessity of Specification

The necessity of specifications of a particular work are the following:

- (i) Specifications of a work define the quality and quantity of materials to be used in the work. Thus a contractor who is filling the tender for the work is able to quote the correct rates for the different items of the work.
- (ii) Specifications act as guide for the contractor and for the supervisor during execution of the work. The work is executed strictly as per the specifications and contractor is paid accordingly. Any deviation from the specification is treated as breach of contract.
- (iii) Specifications specify the tools and equipments required for the work and thus enables to procure them before hand.
- (iv) As it is an essential contract document, hence is required for court cases or any arbitration.

### 1.3 Types of Specification

Specifications are of two types:

- (i) Brief specification
- (ii) Detailed specification

(i) **Brief specification:** In brief specification, nature and class of the work and the materials to be used in the work is written in brief. They do not form the part of the tender document but are useful for preparing the estimate for the work.

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 ne white - washed - three coats.  
 - Doors & Windows frames shall be of seasoned teak w

- Distemper shall be applied to the finished surface with painting brush. Second coat shall be done during hot weather but not during too hot, nor wet weather.
- **Water Proofing Cement Based Paint:**
- Cement based paint (IS:5410) of approved manufacture, quality, shade and colour shall be used.
- Wherever scaffolding is necessary, it shall be erected on double supports tied together by horizontal pieces, over which scaffolding planks shall be fixed. It shall be rigid and strong enough to withstand the load likely to come.
- The surface shall be thoroughly cleaned off dirt, dust, algae, grease and other foreign matter by brushing and washing the surfaces. The surface shall be well watered before the waterproof cement paint is applied. The prepared surface shall be got approved by Engineer-in-Charge before starting the painting work.
- The waterproof cement paint shall be mixed with water in such quantities as can be used with in an hour of its mixing as otherwise the mixture will set and thicken.
- Water proof cement paint shall be mixed with water in two stages. In the first stage, 2 parts of water proof cement paint and one part of water is mixed and stirred thoroughly, and left for 5 mins. Care shall be taken to add the water proof cement paint gradually to the water. In the second stage, further one part of water shall be added to the mixture to get cement paint of workable consistency.
- The cement paint shall be applied on the clean and wetted surface with brushes. The solution shall be stirred at regular intervals during the period of application. Second coat is applied after 4 hours and during this period surface should be kept moist.
- After application of cement paint, the surface shall be kept moist for 2 days by watering it at regular intervals.
- Distemping work shall be measured in sq.m. Deductions shall be made for opening/obstructions not painted, if they are individually more than 0.05 sqm.

11. **Woodwork for Floors and Windows:**

- All timber mentioned in the item in schedule of quantities shall be free from sap wood. It shall be uniform in texture, straight in fiber and shall be well and properly seasoned. It will be free from all defects and any other damages of harmful nature which will affect the strength, durability, appearance. Timber shall of kind as specified like teak, shisham, sal, deodar etc.
- All joints shall be strong and free from wedging and filling.
- **Door Frames(Chaukhats):** All timber for door frames shall be sawn, planed to the correct sizes and shall be as indicated in drawing or as specified. All joints shall be pinned with corrosion resistance metal pins and shall be coated with white lead. The faces of door frames which will remain concealed, shall be painted with two coats of coaltar or solignum. The other faces shall be painted with wood primer.
- The door frames shall be provided with 6 nos. (3 nos on each vertical member) approved iron hold fasts, fabricated out of 30 x 3 mm section, 300 mm long M.S. flats with spliced end. These M.S. hold fasts shall be embedded in plain cement concrete (1 : 3 : 6) block of size 150 mm x 75 mm. depth or for full width of brick masonry.

after soaking in water. They shall be homogeneous in texture and emit a clear ringing sound on being struck. Dry bricks should not absorb more than one-sixth of their weight when immersed in water for one hour. They should not break when two bricks in two hands are struck together.

Shutters: Shutters shall be paneled, glazed or part paneled and part glazed as specified. The thickness of shutters shall vary from 30 mm to 50 mm or as specified. Each panel shall be in a single width piece, but when two or more pieces have to be used and these shall be jointed with a tongue and groove joint with chamfered edges glued together and reinforced with metal dowels.

- Glazing work shall be generally with 4 mm. thick plain sheet glass unless otherwise mentioned in the schedule of quantities.
- Handles shall be provided on both sides of doors and in case of window it shall be provided on the inner side. All fittings of doors and windows shall be of standard quality made of iron or brass. Screws shall be of correct diameter and of correct length. Screws shall be fixed with screw driver and not by hammering.
- Door frame and shutters shall be painted with two coats of approved paints over a coat of primer.
- The door frame shall be measured in cu.m and shutters shall be measured in sq.m in closed position. Overlapping position shall not be included in the measurement.

#### 12. Painting Steel and Iron Work:

- The surface to be painted shall be prepared by rubbing with sand paper and shall be made free from rust, dirt, oil and grease. Corners shall be rubbed and cleaned properly with sand paper. A coat of red oxide primer is applied on the surface immediately after cleaning the surface and is allowed to dry for at least 24 hours. Two coats of ready-mixed enameled paint of approved quality is applied over the surface either by brush or by spray machine. If applied by brush, the paint shall be stirred at regular intervals. Second coat shall be applied after first coat dried up. Painting shall be carried out in dry weather.
- Painting work shall be measured in sq.m.

### EXERCISES

1. What is a contract? Explain different types of contract.
2. What are the essential elements of a contract? Explain briefly.
3. Define the term 'contractor'. What are the essential qualifications of a contractor?
4. Write advantages and disadvantages of :
  - (a) Item rate contract
  - (b) Lump-sum contract
  - (c) Scheduled contract
5. Define the followings :
 

(a) Tender	(b) Tender form
(c) Notice inviting tender	(d) Global tender
(e) Comparative statement of tenders	(f) Informal tender
(g) Unbalanced tender	
6. What do you mean by an unbalanced tender? Explain with an example.
7. Define the followings :
  - (a) Earnest money
  - (b) Security deposit
  - (c) Retention money
8. Differentiate between security deposit and retention money.



Finishing - Inside and outside shall be 12 mm thick cement plastered  
 - The inside of drawing, dining and bed room shall be finished with  
 remaining work.

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