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Section – B
Specification Of Works

☒ An engineering specification contains detailed description of all workmanship and materials which are required to complete an engineering project in accordance with its drawings and details.

☒ Necessity:–

(i) The cost of an unit quantity of work is governed by its specification.

(ii) Specifications of a work are required to describe the quality and quantity of different materials

(iii) This also specifies the workmanship and the method of doing the work.

(iv) A work is carried out according to its specification and the contractor is paid for the same.

(v) Rate of work is based on specification

(vi) It is necessary to specify the equipments, tools and plants to be engaged for a work and thus enables to procure them beforehand

(vii) The necessity is to verify and check the strength of materials for a work involved in a project.

(viii) It is an essential contract document and

is required for arbitration or court cases.

Types:-
(a) General Specifications
(b) Detailed Specifications

(a) General Specifications :-

→ • In this, nature and class of works, names of materials and proportion that should be in the various items of works are described.
→ • Only a brief description of each and every item is given.
→ • It is useful for estimating the project.
→ • Without going through the lengthy detailed specifications, general information for the quantities of materials, nature and class of work can be known from the general specifications, but they do not form part of the contract document.

(b) Detailed Specifications :-

→ The detailed specifications for a particular item specify the qualities, quantities, and proportions of materials, and the method of

preparation and execution for that particular item of work in a project.

→ • The type of machinery, equipments and special tools and plant their methods of operation when involved during execution are described in the detailed specification.

→ • This also specify the involvements and responsibility for auxiliary works, incidental damages etc. during execution of the original work.

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✱ General Specifications of a first class building :→

(a) Foundation and Plinth :- Brickwork in foundation and plinth shall be of first class brick in cement or lime mortar over cement or lime-concrete.

(b) Filling : Foundation trenches and plinth shall be filled up with local sand

(c) Damp-proof-Course (D.P.C.) :- D.P.C. shall be 2.5 cm thick cement concrete or 2cm thick cement mortar with 5% pridlo by weight of cement or other standard water-proofing material.

(d) Superstructure: It shall be of first class brickwork in cement mortar.

(e) Roofing:- The roof shall be 10 cm average thick lime terracing over it.

(f) Flooring: Mosaic flooring shall be 10 cm thick R.C.C. slab with 10 cm average provided in all floors including staircase.

(g) Finishing:- Inside and outside shall be 12 mm thick cement plastered. The inside of drawing, dinning and bed rooms shall be distempered and remaining portions white-washed three coats. The outside shall be two coats decorative waterproof cement coating.

(h) Doors and Windows:- Doors and windows frames shall be of seasoned teak wood and shutters of 3 cm thick teak wood panelling. Brass fitting shall be provided.

(i) Miscellaneous:- Rain-water pipes shall be of asbestos cement or cast-iron, finished with paint.

☒ Second Class Building:-

(a) Foundation and Plinth: The brickwork, in foundation and plinth shall be of

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first class brick with lime mortar over lime concrete.

(b) Filling:- Foundation trenches and plinth shall be filled up the earth.

(c) Damp Proof Course:- D.P.C shall be 2cm thick cement mortar with 5% pudla by weight of cement or other water-proofing materials

(d) Superstructure:- It shall be 2nd class brickwork in mud mortar.

(e) Roofing:- The roof shall be flat terraced roof or R.B. roof.

(f) Flooring:- It shall be 2.5cm concrete over 7.5cm lime concrete.

(g) Finishing:- The inside walls shall be plastered with lime or cement mortar, outside walls shall be painted or plastered with lime of cement-mortar.

(h) Doors and Windows:- Doors and windows frames shall be of seasoned teak wood and shutters of 4.5 cm shisham or deodar wood, panelled. They shall be fitted with iron fittings. These shall be painted with two coats.

(i) Miscellaneous:- Rain water pipes shall be cast-iron. Electrification, sanitary and water supply fittings shall be class A-type.

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First-class Bricks:- Bricks should be moulded from good-earth, free from all traces of saltpetre or or other salts. They should be of uniform, deep-red, cherry or copper colour, throughly burnt without being vetrified. They should be hard, sound and of uniform sizes and shape having each two adjecent plane surfaces at true right angles. The bricks should be free from cracks, chips, flaws, or humps of any kind. They should not show any sign of efflorescene either in dry state or after soaking in water. ~~"They sh~~ "Dry bricks should not absorb more than one-sixth of their weight when immersed in water for one hour."
Bricks should be of standard dimensions as per I.S.I (19 cm × 9 cm × 9 cm) or as per P.W.D.

Cement:- The cement used for reinforced concrete works shall be ordinary Portland Cement or rapid-hardening Portland Cement. The minimum compressive strength of ordinary portland cement as per IS 269

should be 175 Kg/cm² after 7 days and the minimum tensile strength after 7 days should be 25 Kg/cm². The initial setting time should not be less than 30 minutes and the final setting time should not be more than 10 hours.

- Sand:- The fine aggregate (sand) shall conform to either IS 383-1963 or IS 515-up-to-date. It shall be clean, sharp, heavy and gritty to touch. Sand should be free clay, mica, vegetable and organic matter or any other foreign matter. River and pit sand should be used as this does not contain common salt in large quantities. Sand must be cleaned by screening before its use. If a sample of sand contains more than 4 to 6 percent of clay, it should be washed thoroughly. Sand should be perfectly dry before it is used. Otherwise the bulking effect of sand must be taken into account.

- Water:- In concrete works the water used for both mixing and curing shall be free from injurious amounts of deleterious materials. Portable water

is generally considered satisfactory for mixing and curing concrete.

Lime :- (a) Quick-lime or White-lime
This should be obtained by burning pure lime-stone, chalk or sea-shells in a kiln. The burning should be done with coal, charcoal or firewood as fuel, but it should not be with cow-dung. Unslaked white lime weighs 2.14 kg/m^3. The tensile strength of briquettes after 24 hours curing by immersion in water should be 12.8 kg/cm^2.

(b) Hydraulic or Kankar lime :-
This should be obtained by burning broken Kankar or clayey limestones 5 cm gauge and free from sand grains. The burning should be done with coal, charcoal or firewood as fuel but not with cow-dung. After burning, the pieces of kankar should be picked up to exclude ash and over or underburnt pieces. Slaking should be done on a brick platform. Slaking should be done just before use and not immediately after burning. The tensile strength of

briquettes after 24 hours curing by immersion in water should be 7 kg/cm².

- **Coarse-aggregate :-** Aggregate most of which is retained on 4.75 mm IS sieve and containing only so much finer material as is permitted for the various types.

(a) **Quality of aggregates :-** Aggregates shall consist of gravel or stone, crushed or uncrushed, or a combination thereof. It shall be hard, strong, dense, durable clean and free from adherent coatings.

(b) **Deleterious materials :-** Aggregates shall not contain any harmful material in such quantity as affect the strength or durability of the concrete or in addition to the above for reinforced concrete, any material which might affect the reinforcement.

(c) **Mechanical Properties :-** The aggregate crushing value, when determined in accordance with IS 2386 (part 4), mechanical properties shall not exceed 45% for aggregates used for concrete other than for wearing surfaces and 30% for concrete for wearing surfaces such as runway, roads and pavements.

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✱ **Reinforcement:-** The reinforcement shall be of mild steel and medium tensile steel wire, or cold twisted steel bars or deformed steel bars. All reinforcement shall be clean and free from loose mill-scales, dust and coats of paints, oil or other coatings which may destroy or reduce bond.

Welded joints in reinforcement may be used but in all cases of important connections, tests shall be made to prove that the joints are of the full strength of bars connected.

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✱ **Earthwork in excavation of foundation trenches:-**

1) Before the earthwork is started, the whole area where the work is to be done shall be cleared of grass, roots of trees and other organic matter.
2) The excavation shall be carried out exactly in accordance with the dimensions shown on the drawings or such other dimensions as the Engineer-in-charge may decide.

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3) Sides of the trenches shall be vertical and its bottom shall be perfectly levelled both longitudinally and transversely. Where the soil is soft, loose or slushy the trench shall be widened for allowing steps on either side or the sides sloped or shored up.

4) During excavation if rocks or rocky soils are found, those shall be levelled as far as possible and the small spaces which are difficult to level shall be filled in with concrete.

5) If the excavation is in earth, the bottom of the trenches shall be sprinkled with a little water and rammed. Any excess digging or any patches of bad soil or hollows shall be removed by placing concrete or shall be subject to any other special treatment.

6) No material excavated from foundation trenches, shall be placed nearer than one meter to the outer edge of the excavation.

7) Water in trenches must be bailed or pumped out and where it is apprehended that the sides may fall down arrangement shall be made for adequate timber shoring.

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8) When it is specified that the work is to be carried out without removing pipes, cables, sewers, etc., all of them shall be temporarily shored and saved from any damage.

9) The materials or valuables found during excavation shall be the property of the of the government.

10) The cost of all materials and labour required for fencing in and protection against risk of accidents due to open excavation shall be provided.

Earthwork in filling :-

(a) Earth :- Earth used for filling shall be loose, free from brick-bat, stone, boulder not larger than 75 mm in any direction. Salts, organic or other foreign matter. Normally, excavated earth from the same area shall be used for filling. However, if such earth contains deleterious material, saltpetre, earth etc. the same shall not be used.

(b) Filling :- The spaces around the foundations, pipes and drains in

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trenches shall be cleared of all debris, brick-bats etc. The filling shall be done in layers, not exceeding 20 cm each layer. Each layer shall be watered, rammed and consolidated before the succeding one is laid. Special care shall be taken that no damage is caused to the pipes, drains and masonry in the trenches below. In case of filling under floors the finished level of filling shall be kept sloping, as intended to be given to the floor.

Cement Concrete :-

(a) Materials :- (1) Coarse Aggregate :- It shall be crushed or broken from hard stone obtained from approved quarry. It shall be hard, strong, dense, and durable, clean and free from soft friable, thin, flat, elongated or laminated, flaky pieces and shall be roughly cubical in shape. It shall be clean and free from dirt and any other foreign matter. Unless specially mentioned the size of the coarse aggregate shall be 20 mm graded down and shall be retained in a 5mm square mesh so that the voids do

not exceed 42 percent. In case of road or mass concrete work bigger size 40 to 60 mm may be specified.

(2) Fine Aggregate :- Sand (4.75mm) as fine aggregate shall be coarse, consisting of sharp, angular grains and be of standard specification. It shall be clean and free from dust, dirt and organic matters. Sea Sand shall not be used. Crushed dust stone may also be used as fine aggregate.

(3) Cement :- It shall be fresh portland cement and conform to the IS:269 up-to-date modification.

(4) Water :- Water used shall be clean and reasonably free from injurious quantities of deletrious materials such as oils, acids, alkalies, salt and vegetable growth. Generally portable water shall be used.

(b) Proportioning :- Proportion of cement, sand and coarse aggregate shall be 1:2:4 or as specified. Coarse aggregate and sand shall be measured by measuring box of 30 cm x 30 cm x 38 cm or of suitable size equivalent to the content of one bage of cement of

1/30 m^3 or 0.035 m^3.

(c) Mixing:→ (i) Hand mixing:- It shall be permitted on small works. "Write more, by wiself".

(ii) Machine mixing:- The mixer drum shall be flushed clean with water. Measured quantity of dry coarse aggregate shall be placed first in the hopper. This shall be followed with measured quantity of fine aggregate and then cement. "Write more".

Mixing Time:- The materials shall be mixed in a drum for a period of not less than 2 minutes and until a uniform colour and consistency are obtained. The time shall be counted from the moment all the materials have been put been put into the drum.

(d) Consistency:- The quantity of water to be used for each mix of 50Kg cement to give the required consistency shall not be more than 34 litres for 1:3:6 mix, 30 litres for 1:2:4 mix, 27 litres for 1:1½:3 mix and 25 litres for 1:1:2.

(e) Laying:- The entire concrete used in the work shall be laid gently in layers not exceeding 15 cm and shall be throughly vibrated by means of mechenical

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vibrations till a dense concrete is obtained. The layers of concrete shall be so placed that the bottom layer does not finally set before the top is placed. Compaction shall be completed before the initial setting starts i.e. within 30 minutes of addition of water to the dry mixture. "During cold weather casting of concrete shall not be done when the temperature falls below 4.5°C. During hot weather precautions shall be taken to see that the temperature of wet coarse concrete does not exceed 38°C."

(f) Protection and Curing:- Freshly laid concrete shall be protected from rain by suitable covering. After the concrete has begun to harden i.e. about 1 to 2 hours after its laying, it shall be protected with moist gunny bags, sands or any other material against quick drying. After 24 hours of laying of concrete the surface shall be cured by flooding with water of about 25mm depth or by covering with wet absorbent materials. The curing shall be done for a

minimum period of 14 days.

(g) Form Work :- If centering and shuttering are required to be done for this work these shall be done in accordance with the specifications for form work under Reinforced cement concrete.

☒ Reinforced Cement Concrete (R.C.C.):-

(a) Form Work :→ It shall include all forms or moulds required for forming the concrete.

(i) Materials for form work :- Form work shall be of plywood, or steel. Timber used for form work shall be easily workable with nails without splitting and light weight. It shall be stiff and strong enough to avoid under deflection when loaded and not liable to warp when exposed to sun and rain or wetted during casting of concrete.

(ii) Propping and Centering :- Props used for centering shall be steel, timber, posts, ballies or any other material approved. In case when ballies are used none shall be less than 100 mm in diameter measured at mid length and 80 mm at thin end. In case a span exceeds 4.50m and height exceeds 3.50m suitable horizontal as well

diagonal bracings shall be provided.

(b) Shuttering:- The shuttering shall be of approved dressed timber of well seasoned wooden boards to give a smooth and even surface and the joints shall not permit leakage of cement grout. The timber shall be free from loose knots, projected nails, splits, adhering grout or other defects that may mar the cement surface of concrete.

(i) Surface treatment for shuttering

(ii) Camber (iii) Removal of Form work

(c) Reinforcement:- Mild steel bars shall conform to the I.S. Specification, free from loose rust, dust, loose mill scales, coats of paints, oil or other coatings which may destroy or reduce bond. It shall be stored in such a way so as to avoid distortion and to prevent corrosion.

(i) Bending of overlapping:- Bars shall be bent, cold, correctly and accurately to the size and shape as shown on the detailed drawing. Overlapping of bars can be kept apart by 25 mm or 1½ times the maximum size of coarse aggregate whichever is

greater, with concrete between them.

(ii) Placing in Position:- Bars at their points of intersection shall be securely tied together with two strands of annealed steel wire 0.90 to 1.6 mm thick twisted tight to make the skeleton of the steel work rigid.

(d) Placing of Concrete:- (a) Materials for Concrete:- Same as cement concrete except the size of coarse aggregate shall be 20 mm unless specially mentioned in the type of work.

(i) Proportioning of Concrete:- Same as cement concrete

(ii) Mixing:- Concrete shall be mixed by mechanical mixer except for small quantity when Engineer-in-charge permits.

(iii) Consistency or Workability:- It depends on whether the concrete is vibrated or hand tamped. It shall be determined by slump tests.

(e) Placing of Concrete:- Pouring into moulds! Same as before

(f) Compaction:- Concrete shall be compacted into a dense mass immediately after placing by means of mechanical vibrators designed for continuous operations. For certain

items, such as roof slab, depending on the thickness of the members and feasibility of vibrating the same, the Engineer-in-charge may permit hand compaction. It shall be done with the help of 16 mm dia. steel tamping rod and tamping with wooden tampers.

(g) Construction Joints:- Same as before

(h) Curing:- Same as cement concrete

(i) Finishing:- In case of roof slabs the top surface shall be finished even and smooth with wooden trowel, before the concrete begins to set.

(j) Testing Concrete:- Work tests and slump tests shall be carried out as per standing practice. Three test specimen shall be made from each sample for testing at 28 days.

☒ Brickwork:- (a) Material:- Bricks shall be first class of standard specification, regular in shape and size with sharp edges and corners. "Same as before".

(b) Mortar:- In the case of cement mortar the unit of measurement for cement shall be a bag of

cement and this shall be taken as 0.035 m^3. Sand in specified proportion shall be measured in boxes of suitable size 35 cm × 25 cm × 40 cm.

(c) Soaking of Bricks:- All bricks shall be throughouly soaked in water by submerging them in clean water for at least four hours before use. The wetted bricks shall be stacked on a clean platform to avoid any contact with mud.

(d) Laying:- The brick laying shall be of English bond unless specially mentioned. A layer of mortar shall be spread on full width over a suitable length of the lower course. Each brick shall be properly bedded with frog upward and set home by gently tapping with handle of trowel or wooden mallet.

(e) Joints:- Brick shall be so laid that all joints are full of mortar. The thickness of joints shall not exceed 1 cm. All face joints shall be raked to a minimum depth of 15 mm by raking tool during the progress of work.

(f) Brick coping:- The top courses of all plinth parapet, steps and top wall below R.C.C. shall be laid with brick on edges unless specified otherwise.

(g) Curing:- Brickwork shall be protected from rain by suitable covering when the mortar is green. Masonry work in cement mortar or lime mortar shall be kept constantly moist on all faces for a minimum period of seven days.

(h) Scaffolding:- For all exposed brickwork, double scaffolding having two sets of vertical supports shall be provided. The supports shall be sound and strong, tied together with horizontal pieces over which scaffolding planks shall be fixed. For all other brick work in buildings, single scaffolding shall be permitted.

Damp Proof Course (D.P.C.):-
D.P.C of cement concrete should have a mix of 1:2:4 or 1:1½:3 usual thickness 2.5 cm to 4 cm.

(a) Material:- Coarse aggregate shall be of clean, hard and dense stone chips 12 mm down and shall be washed before use. Sand shall be clean, sharp and coarse of average 5mm size and shall be free from dust, and dirt and screened before

use.

(b) Mixing:- Coarse aggregate and sand shall be measured by volume with gauge boxes and cement by bag having a weight of 50 kg or volume of $0.0347\ m^3$.

(c) Preparation of base:- The top of the walls on which damp-proof course is to be laid shall be constructed with bricks on edge or with frogs of the brick down.

(d) Laying:- Damp-proof course may be to the full width of the plinth or the superstructure as specified in the drawing or specially mentioned. It shall be laid to the specified thickness (2.5 cm or 4 cm) over the plinth wall flush with the floor surface and shall not be carried across the doorways or each other openings. D.P.C. shall then be consolidated by tamping and levelled both longitudinally and transversely. Laying shall be completed on same day, the joints or breaks shall be given at the door openings.

(e) Curing:- Damp-proof course shall be kept wetted for atleast 7 days after laying, if the brickwork is not ready to proceed further.

☒ **Artificial Stone flooring or Cement Concrete flooring :-** (Usual thickness 2·5 cm). The ingredients are cement, sand and stone chips in the proportion 1:2:4 or as specified. (This is also known as patent stone flooring when crushed blast surface slag is used as coarse aggregate.)

(a) **Material :-** Coarse-aggregate shall be stone chips well graded from 12 mm down, free from dust, dirt, etc. hard and rough. Sand shall be coarse 5 mm maximum size, clean, free from dirt etc. Cement shall be portland cement.

(b) **Sub-grade :-** The sub-grade shall be provided with the slopes required for the flooring. Plinth masonry off-set shall be depressed so as to allow the sub-grade concrete to rest on it.

(c) **Proportioning and mixing :-** Usual proportion of cement, sand and coarse aggregate shall be 1:2:4 or as specified. Mixing of concrete shall be done by hand or by mechanical mixer. Required amount of water 32 litres per bag of cement as per water cement ratio shall be added slowly and gradually to mix the concrete wet to have a

uniform plastic mix. The mixture shall be have a slump of not more than 4 cm. Concrete for one panel only shall be mixed at one lot.

(d) Laying:- Flooring of specified thickness shall be laid in the pattern as given in the drawings. The panel shall be of uniform size and no dimensions of a panel shall exceed 2m and the area of panel shall not be more than 2 m^2. The whole operation of laying in one panel shall be completed within 30 minutes.

(i) Laying with strips (ii) Strips fixing (iii) Laying without strips (iv) Shuttering (v) Casting of concrete (left for 24 hours)

(e) Finishing:- The surface shall be left for some time, till moisture disappears from it. Excessive trowelling shall be avoided. Use of dry cement or cement and sand mixture sprinkled on the surface shall then to stiffen the concrete or absorb excessive moisture, shall not be permitted. Fresh quantity of cement at 2 kg of cement shall be mixed with water to form a thick slurry and spread over an area of one m^2 flooring while the concrete is still green.

(f) Curing:- The curing shall be done for a minimum period of ten days. Curing shall not be commenced until the top layer has hardened.

Patent Stone Floor:- The preparation and method of construction is the same as that of the artificial stone or cement concrete floor. The only difference is that the coarse aggregate shall be of crushed blast furnace slag.

Cement Plastering:- (a) Materials:- Cement shall be fresh portland cement and sand shall be medium quality, cleaned, free from organic matter or salts.

(b) Preparation of mortar:- The materials shall be at first mixed dry throughly till uniform in colour in the required proportion and then shall be mixed wet adding water slowly and gradually for at least four times to give a uniform paste.

(c) Preparation of surface:- The surface of the wall shall be brushed, cleaned, washed, watered and wetted with water before plastering. In case of cement

plaster on cement concrete the face shall be lightly roughened, cleaned, washed and wetted. To ensure uniform thickness of plaster as specified, narrow strips of about 10 cm wide plaster shall be applied first a distance of about 1 m centres and the gaps between such strips shall immediately be filled up with mortar.

(d) Laying:- The plastering shall be started from the top and worked towards the ground. The whole surface shall be made flush with wooden straight edges and rubbed throughly with wooden floats to ensure an even surface.

(e) Curing:- Plastering surface shall be kept wet by sprinkling water after 12 hours for at least 7 days and shall be protected from rain or sun.

White Washing:- (a) Scaffolding:- Wherever scaffolding is necessary, it shall be erected on double supports tied together by horizontal pieces, over which scaffolding planks shall be fixed. No ballies, bamboos or planks shall rest on or touch the surface which is being white-washed. For white-washing the ceiling, proper stage scaffolding shall be erected.

(b) Preparation of Surface :- Before new work is white-washed, the surface shall be throughly brushed free from mortar droppings and foreign matter. In case of old work, all loose pieces and scales shall be scraped off and holes in the plaster as well as patches of less than 50 cm² area shall be filled up with mortar of the same mix.

(c) Preparation of Lime-wash :- The wash shall be prepared from fresh stone white lime. The lime shall be throughly slaked on the spot, mixed and stirred with sufficient water to make a thin cream. This shall be allowed to stand for a period of 24 hours and then shall be screened throughly a clean coarse.

(d) Application :- The white-wash shall be applied with moonj or jute brushes to the specified number of coats. The operation of each coat shall be consist of a stroke of the brush given from the top downwards, another from the bottom upwards over the first stoke. The washing of ceilings should be done prior to that on walls.

(e) Protective measures :- Doors, windows, floors, articles of furniture etc. and other parts of the building not to be white-washed shall be protected from being splashed upon.

Colour Washing :- The same as white washing except that the mineral colors, not affected by lime, shall be added to white wash. Indigo (Neel) shall, however, not be added. No colour wash shall be done until a sample of the color-wash of the required shade has been got approved the Engineer-in-charge. For new work, the priming coat shall be of white-wash with lime or with whiting as specified.

Distempering :- (a) Materials :- The distemper shall be of the colour as specially mentioned and shall be throughly mixed with the quantity of water as prescribed by the manufacturer. Only the required quantity (generally 12 kg per 100 m² for 1st coat and 7.5 kg for subsequent coats) shall be mixed at a time as required for the day's work. It shall be well stirred.

(b) Preparation of Surface :- New plastered surface shall be throughly brushed free from mortar droppings and other foreign matter and rubbed smooth with sand-paper. New surface shall be allowed to dry up before any operation for distempering and the surface shall be washed over with a solution of zinc sulphate. 1 kg of zinc sulphate shall be mixed in 10 litres in water. The washed surface shall be allowed to dry up.

(c) Application :- No distemper shall be applied in wet weather. Distemper shall be applied with proper distemper brushes but not white-wash brushes. The subsequent coat shall be applied only after the previous coat has dried.

☒ Painting to new woodwork :- Painting shall be carried out at the driest season of the year. All woodwork shall be seasoned and the surface to be painted shall be dry, rubbed down smooth with medium and fine sand-paper and throughly cleaned. Knots or holes shall be covered or filled in with a

mixture of red lead and glue in equal quantities laid on hot, which is called knotting. Knots in resinous wood shall be painted over with hot lime and scraped off after 24 hours and be primed with red or white lead and linseed oil. When dry, they shall be rubbed with pumice-stone.

☒ Painting to iron work:- All rust, scales, dirt, suppliers, delivery marks, oil, grease etc. shall be removed by approved means before painting. Special cares shall be taken for cleaning of corners. All structural steel work shall be primed with red lead before erection except the surfaces which will be in contact with concrete. Two to three coats of approved ready-made paint shall be applied at right angles to each other after erection of the structural member. Each coat shall be dry up perfectly.

☒ Painting to Plaster:- The plastered on walls shall be cleaned and primed with boiled linseed oil or glue size. In case of new cement plaster, the priming coat shall be applied with a solution of 2.25 kg of zinc sulphate in 5 litres of water and when it is dried up, a coat of raw linseed

oil should be given. The first and second coat shall consist of white lead and boiled linseed oil. The third coat shall be applied with white lead only. The final coat shall consist of a larger proportion of turpentine with a little varnish to serve as a binder and it shall be applied evenly with a hard brush when the previous coat is still tacky.