

Item No.1

Steel Work, Riveted in Built-up Sections Framed Work Including Cutting, Hoisting, Fixing in Position and Applying a Priming Coat of Red Lead Paint in Beams and Joists, Channels, Angles, Tees, Flats with Connecting Plates or Angle Cleats as in Main and Cross Beams, Hip and Jack Rafters, Purlins Connected to Common Rafters and the Like.

1.0 Materials

1.1 Structural steel sections such as beams, joists, channels, angles, tees, flats, plates and cleats shall conform to the relevant Indian Standards and approved specifications.

1.2 Rivets shall conform to the relevant Indian Standards and shall be of approved quality, size and dimensions as specified in the drawings.

1.3 Red lead priming paint shall conform to the relevant Indian Standards and shall be approved by the Engineer-in-Charge.

1.4 All materials shall be free from defects, cracks, laminations, excessive rust, scale and other imperfections.

2.0 Workmanship

2.1 Fabrication

2.1.1 All structural steel members shall be fabricated strictly in accordance with the approved drawings and specifications.

2.1.2 Cutting, drilling, punching, shearing, bending and other fabrication operations shall be carried out accurately to the required dimensions and tolerances.

2.1.3 The edges of members shall be clean and true. Any burrs or irregularities shall be removed before assembly.

2.1.4 Members shall be assembled correctly and temporarily secured before riveting to ensure proper alignment and fit.

2.2 Riveting

2.2.1 Rivets shall be heated uniformly and driven while hot to completely fill the rivet holes and form sound heads.

2.2.2 All rivets shall be properly centered and tightly driven. Loose, cracked, burnt or otherwise defective rivets shall be removed and replaced.

2.2.3 Rivet holes shall be accurately matched and aligned before riveting operations are commenced.

2.2.4 The finished riveted joints shall be rigid, tight and free from distortion.

2.3 Hoisting and Erection

2.3.1 All fabricated members shall be carefully transported, lifted, hoisted and erected without causing damage or distortion.

2.3.2 The steel framework shall be erected true to line, level and plumb and shall conform to the approved drawings.

2.3.3 Temporary bracing, supports and guys shall be provided wherever necessary to maintain stability during erection.

2.3.4 All members shall be fixed in their correct positions and securely connected before final tightening and completion of the work.

2.4 Surface Preparation

2.4.1 Before application of primer, all steel surfaces shall be thoroughly cleaned of rust, scale, grease, oil, dirt and other foreign matter by wire brushing, scraping or approved mechanical means.

2.4.2 The cleaned surfaces shall be dry and free from dust before application of paint.

2.5 Priming Coat

2.5.1 After fabrication and surface preparation, one coat of approved red lead priming paint shall be applied uniformly to all exposed steel surfaces.

2.5.2 The primer shall be brushed evenly to produce a continuous and uniform protective coating.

2.5.3 Areas inaccessible after erection shall receive the priming coat before assembly and fixing.

2.6 Tolerances

2.6.1 The completed steel framework shall conform to the permissible tolerances specified in the relevant Indian Standards.

2.6.2 Any member found distorted, improperly aligned or defective shall be rectified or replaced at the contractor's expense.

3.0 Mode of Measurement and Payment

3.1 The quantity of steel work shall be measured by weight in kilograms based on the finished work actually erected in position.

3.2 The weight shall be calculated from the dimensions shown on the approved drawings using the standard unit weights of structural steel sections.

3.3 No allowance shall be made for wastage, rolling margin, rivet heads, clips, temporary supports, erection appliances or other incidental items.

3.4 The rate shall include the cost of supplying all materials, fabrication, cutting, drilling, punching, riveting, hoisting, erection, fixing in position, scaffolding, tools and plant, labour, transportation, application of one coat of red lead primer and all incidental charges necessary for completion of the work.

3.5 The rate shall be for a unit of **One Kilogram (Kg)**.

Item No.2

Providing & Fixing Precast Concrete Kerb Stones

Providing and fixing M30 grade factory made precast exposed/fair finish concrete kerb stones of approved make and sample, of required size and shape, including excavation, preparation of foundation, laying on M15 grade concrete base, curing, formwork wherever required, flush pointing in cement mortar 1:2 (1 cement : 2 fine sand) for all joints, fixing in

position and completing the kerb system including all necessary accessories such as chamfered/pencil corner kerbs, radius kerbs, corner kerbs, quadrant kerbs, drain out kerbs, flat kerbs, parking edge kerbs, ramp kerbs etc. complete as per drawings and directions of Engineer-in-Charge.

1.0 Materials

1.1. Precast kerb stones shall be of **M30 grade concrete** manufactured in factory with exposed/fair finish surface and shall be of approved make and quality.

1.2. The size, shape, profile and finish of kerb stones shall be as per approved drawings and sample approved by the Engineer-in-Charge.

1.3. Concrete for foundation base shall be **M15 grade concrete** conforming to relevant specifications.

1.4. Cement mortar for joint filling and pointing shall be **1:2 (1 cement : 2 fine sand)** and shall conform to relevant specifications.

1.5. All materials including concrete, cement, sand and accessories shall be of approved quality and shall comply with relevant IS specifications.

2.0 Workmanship

2.1. Preparation of Foundation

2.1.1. The alignment and levels of kerb installation shall be set out as per drawings or as directed by the Engineer-in-Charge.

2.1.2. Excavation shall be carried out to the required width, depth and profile for laying the kerb foundation.

2.1.3. The excavated surface shall be properly cleaned, leveled, watered and compacted before laying the concrete foundation.

2.2. Laying of Concrete Base

2.2.1. A foundation bed of **M15 grade concrete** shall be provided below the kerb stones as per approved design and dimensions.

2.2.2. The concrete base shall be properly compacted, finished to required level and cured as specified.

2.3. Fixing of Precast Kerb Stones

2.3.1. Precast kerb stones shall be carefully handled and placed on the prepared concrete foundation in correct alignment, level and position.

2.3.2. The kerbs shall be fixed firmly without displacement and shall form a continuous and uniform kerb line.

2.3.3. Necessary special kerbs including radius kerbs, corner kerbs, quadrant kerbs, drain out kerbs, flat kerbs, parking edge kerbs and ramp kerbs shall be provided wherever required as per drawings.

2.3.4. All joints between kerb stones shall be properly filled and flush pointed with cement mortar 1:2.

2.4. Protection and Curing

2.4.1. The exposed surface of precast kerb stones shall be protected with good quality plastic sheets during adjoining bituminous or concrete works to prevent damage and staining.

2.4.2. The kerb stones and foundation concrete shall be properly cured for the required period to achieve adequate strength.

2.4.3. Any damaged or defective kerb stones shall be replaced by the contractor at his own cost.

3.0 Mode of Measurements & Payment

3.1. The measurement of precast kerb stones shall be taken based on the actual volume of kerb stones fixed in position.

3.2. Payment shall be made considering the volume of kerb provided and fixed at site.

3.3. The rate shall include the cost of:

- Providing and fixing M30 grade precast kerb stones.
- Sample approval and matching finish.
- Excavation for foundation.
- M15 grade concrete foundation.
- Formwork wherever required.
- Transportation, handling and fixing.
- Joint filling and flush pointing in C.M. 1:2.
- Curing and protection.
- Providing all types of accessories such as radius kerbs, corner kerbs, ramp kerbs, drain kerbs etc.
- All labour, materials, tools, plants and incidental charges required for completion of work.

3.4. The rate shall be for a unit of **One Cubic Meter (Cum)**.

Item No.3

Excavation for foundation upto 1.5 m depth including sorting out and stacking of useful materials and disposing off the excavated stuff upto 50 Meter lead.(A) Loose or soft soil

1.0. General

1.1. Any soil which generally yields to the application of pickaxes and shovels, phawaras, rakes or any such ordinary excavating implement or organic soil, gravel, silt, sand, turf loam, clay, peat etc., fall under this category.

2.0. Clearing the site

2.1. The site on which the structure is to be built shall be cleared, and all obstructions loose stone, materials and rubbish of all kind bush wood and trees shall be removed as directed. The materials so obtained shall be property of the Government and shall be conveyed and stacked as directed within 50 m lead. The roots of the trees coming in the sides shall be cut and coated with hot asphalt.

2.2. The rate of site clearance is deemed to be included in the rate of earth work for which no extra will be paid.

3.0. Setting out

After clearing the site the centre lines will be given by the Engineer-in-Charge. The contractor shall assume full responsibility for alignment, elevation and dimension of each and all parts of the work. Contractor shall supply labourers, materials, etc. required for setting out the reference marks and bench marks and shall maintain them as long as required and directed.

4.0. Excavation

The excavation in foundation shall be carried out in true line and level and shall have the width and depth as shown in the drawings or as directed. The contractor shall do the necessary shoring and shutting or providing necessary slopes to a safe angle, at his own cost. The payment for such precautionary measures shall be paid separately if not specified. The bottom of the excavated area shall be leveled both longitudinally and transversely as directed by removing and watering as required. No earth filling will be allowed for bringing it to level. If by mistake or any excavation is made deeper or wider than that shown on the plan or directed, the extra depth or width shall be made up with concrete of same proportion as specified for the foundation concrete at the cost of the contractor. The excavation up to 1.5 m depth shall be measured under this item.

5.0. Disposal of the excavated stuff

5.1. The excavated stuff of selected type shall be used in filling the trenches and plinth or leveling the ground in layers including ramming and watering etc.

5.2. The balance of the excavated quantity shall be removed by the contractor from the site of work to a place as directed with lead up to 50 M. and all lift.

6.0. Mode of measurements & payment

6.1. The measurement of excavation in trenches for foundation shall be made according to the sections of trenches shown in the drawing or as per sections given by the Engineer-in-Charge. No payment shall be made for surplus excavation made in excess of above requirements or due to slopping and sloping back as found necessary on account of conditions of soil and requirements of safety.

6.2. The rate shall be for a unit of one cubic meter.

Item No.4

Providing and laying cement concrete 1:3:6 (1-Cement : 3- coarse sand : 6- hand broken stone aggregates 40 mm nominal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth

1.0. Materials

1.1. Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Stone aggregate 40 mm nominal size shall conform to M-12.

2.0. Workmanship

2.1. General

2.1.1. Before starting concrete, the bed of foundation trenches shall be cleared of all loose materials, leveled, watered and rammed as directed.

2.2. Proportion of Mix

2.2.1. The proportion of cement, sand and coarse aggregate shall be one part of cement, three parts of sand and six parts of stone aggregate and shall be measured by volume.

2.3. Mixing

2.3.1. The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be allowed for smaller quantity of work if approved by the Engineer-in-Charge. When hand mixing is permitted by the Engineer-in-Charge in case of breakdown of machinery and in the interest of work, it shall be carried out on a watertight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. However, in such cases, 10 percent more cement than otherwise specified shall be used. Mixing shall continue for a period of 1½ to 2 minutes. The quantity of water shall be just sufficient to produce a dense concrete of required workability for the purpose.

2.4. Transporting & Placing the Concrete

2.4.1. The concrete shall be transported from the place of mixing to the final position in not more than 15 minutes by the method as directed and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water, i.e., before the initial setting commences.

2.4.2. The concrete shall be laid in layers of 15 cm to 20 cm thickness.

2.5. Compaction

2.5.1. The concrete shall be rammed with heavy iron rammers rapidly to obtain the required compaction and to allow all interstices to be completely filled with mortar.

2.6. Curing

2.6.1. After the final set, the concrete shall be kept continuously wet, if required by ponding, for a period of not less than 7 days from the date of placement.

2.7. Mode of Measurement & Payment

2.7.1. The concrete shall be measured for its length, breadth and depth, limiting dimensions to those specified on the drawings or as directed by the Engineer-in-Charge.

2.7.2. The rate shall be for a unit of one cubic meter.

Item No.5

Dismantling steel work including distempering and stacking the materials with all lead and lift.

1.0 Materials

1.1 The relevant specifications of Item No. 20.1(i) shall be followed except that dismantling of steel work shall be carried out instead of fabrication and erection.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of dismantling of existing steel work including cutting, dismembering and removal of structural members as directed at site.

2.1.2 All dismantling operations shall be carried out carefully to avoid unnecessary damage to reusable materials unless otherwise specified.

2.2 Dismantling and Handling

2.2.1 Steel members shall be dismantled in a systematic manner, including cutting of rivets, bolts or welds wherever required.

2.2.2 The dismantled materials shall be properly sorted, stacked and stored at designated locations as directed by the Engineer-in-Charge.

2.2.3 Care shall be taken to ensure safe handling during cutting, lifting, lowering and shifting operations.

2.3 Disposal and Stacking

2.3.1 All dismantled steel materials shall be stacked neatly with proper identification for reuse or disposal as instructed.

2.3.2 Unserviceable materials shall be disposed of at approved locations including all leads and lifts.

3.0 Mode of Measurement and Payment

3.1 The dismantling of steel work shall be measured in kilograms (kg) of steel actually dismantled.

3.2 The rate shall include dismantling, cutting, dismembering, stacking, loading, unloading, transportation and disposal of unserviceable materials.

3.3 The rate shall also include all labour, tools, equipment, leads and lifts required for completion of the work.

3.4 No extra payment shall be made for cutting of rivets, bolts, welds or for sorting and stacking.

3.5 The rate shall be for a unit of One Kilogram (kg).

Item No.6

Dismantling tiled or stone floors laid in mortar including stacking of serviceable materials and disposal of unserviceable materials with all lead and lifts.

1 1.0 Materials

1.1 The relevant specifications of flooring Item shall be followed except that dismantling of existing tiled or stone flooring shall be carried out instead of laying.

1.2 Serviceable materials such as reusable tiles or stone slabs shall be carefully handled to avoid damage.

1.3 Unserviceable debris shall be collected and disposed of at approved dumping locations.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of dismantling of existing tiled or stone flooring including removal of bedding mortar and cleaning of surface.

2.1.2 The dismantling shall be carried out in a controlled manner to avoid damage to adjacent structures or services.

2.2 Dismantling Operation

2.2.1 Tiles or stone slabs shall be carefully lifted, broken only where necessary, and removed from their bedding mortar.

2.2.2 Bedding mortar shall be removed completely to expose the base surface as directed.

2.2.3 All debris generated during dismantling shall be collected and removed from site.

2.3 Stacking and Disposal

2.3.1 Serviceable materials shall be carefully stacked in an approved manner at designated locations for reuse or storage.

2.3.2 Unserviceable materials shall be transported and disposed of at approved dumping yard including all leads and lifts.

2.3.3 The site shall be cleaned and made free from loose debris after completion of work.

3.0 Mode of Measurement and Payment

3.1 The dismantling work shall be measured in square metres (m²) of flooring actually dismantled.

3.2 The rate shall include dismantling of tiles/stone slabs, removal of bedding mortar, stacking of serviceable materials, disposal of unserviceable materials and cleaning of site.

3.3 The rate shall include all labour, tools, equipment, transportation, leads and lifts required for complete execution.

3.4 No extra payment shall be made for breakage, handling or sorting of materials.

3.5 The rate shall be for a unit of One Square Metre (m²).

Item No.7

Painting two coats (excluding priming coat) on new steel and other metal surfaces with synthetic enamel paint, brushing to give an even shade including cleaning the surface of all dirt, dust and other foreign matter.

1.0 Materials

1.1 Synthetic enamel paint shall be of approved brand and manufacture, conforming to relevant IS specifications.

1.2 The paint shall be of required shade as approved by the Engineer-in-Charge.

1.3 Clean water, if required for cleaning purposes, shall be free from impurities.

2.0 Workmanship

2.1 Surface Preparation

2.1.1 The steel/metal surface shall be thoroughly cleaned of all dirt, dust, grease, rust, scale and other foreign matter before painting.

2.1.2 The surface shall be made smooth and dry before application of paint.

2.1.3 Proper cleaning tools such as wire brushes, sandpaper or emery paper shall be used as required.

2.2 Application of Paint

2.2.1 Painting shall be carried out only after the priming coat has been completed and approved.

2.2.2 Two coats of synthetic enamel paint shall be applied evenly by brushing to achieve uniform coverage and shade.

2.2.3 Each coat shall be allowed to dry completely before applying the subsequent coat.

2.2.4 The paint shall be well stirred before and during application to maintain uniform consistency.

2.3 Finishing

2.3.1 The finished surface shall be smooth, uniform and free from brush marks, streaks, patches, runs or sagging.

2.3.2 Care shall be taken to ensure neat edges and uniform coating on all exposed surfaces.

2.4 Protection

2.4.1 Painted surfaces shall be protected from dust, moisture and damage until fully dried and set.

2.4.2 Any damaged or defective paintwork shall be made good at contractor's own cost.

3.0 Mode of Measurement and Payment

3.1 Measurement shall be made in square metres (m²) of painted surface area actually completed.

3.2 The rate shall include cost of synthetic enamel paint, surface preparation, cleaning, application of two coats, brushing, and finishing.

3.3 The rate shall also include labour, tools, scaffolding, wastage, transportation and all incidental charges.

3.4 No extra payment shall be made for minor touch-ups or overlapping areas.

3.5 The rate shall be for a unit of One Square Metre (m²).

Item No.8

Painting one coat (excluding priming coat) on previously painted steel and other metal surfaces with enamel paint, brushing to give an even shade including cleaning the surface of all dirt, dust and other foreign matter.

1.0 Materials

1.1 Synthetic enamel paint shall be of approved brand and manufacture, conforming to relevant IS specifications and of approved shade.

1.2 The paint shall be suitable for application on previously painted metal surfaces.

1.3 Clean water, if required for cleaning, shall be free from impurities.

2.0 Workmanship

2.1 Surface Preparation

2.1.1 The existing painted metal surface shall be thoroughly cleaned of dust, dirt, grease, oil, loose paint, rust and other foreign matter.

2.1.2 All loosely adhering or flaking paint shall be removed by scraping, wire brushing or sand papering to obtain a sound surface.

2.1.3 The surface shall be made dry, clean and suitable for repainting before application of paint.

2.2 Application of Paint

2.2.1 One finishing coat of synthetic enamel paint shall be applied evenly by brushing to achieve uniform shade and finish.

2.2.2 The paint shall be well stirred before and during application to maintain uniform consistency.

2.2.3 The coat shall be applied smoothly without brush marks, streaks, patches or runs.

2.2.4 Special care shall be taken at joints, corners and edges to ensure proper coverage.

2.3 Finishing

2.3.1 The finished surface shall be uniform in colour, smooth in texture and free from defects such as peeling, blistering or uneven patches.

2.3.2 Any defective portion shall be rectified by the contractor at his own cost.

2.4 Protection

2.4.1 Painted surfaces shall be protected from dust, moisture and mechanical damage until completely dry.

3.0 Mode of Measurement and Payment

3.1 Measurement shall be made in square metres (m²) of painted surface actually completed.

3.2 The rate shall include cost of paint, surface cleaning, preparation, application of one coat, brushing and finishing.

3.3 The rate shall also include labour, tools, scaffolding, wastage, transportation and all incidental charges.

3.4 No extra payment shall be made for minor touch-up works or overlapping areas.

3.5 The rate shall be for a unit of One Square Metre (m²).

Item No.9

Wall painting (two coats) with plastic emulsion paint of approved brand and manufacture on undecorated wall surfaces to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and sand paper smooth.

1.0 Materials

1.1 Plastic emulsion paint shall conform to IS 5411 (Part-I) and shall be of approved brand, manufacture and shade.

1.2 Water used for thinning, if required, shall be clean and free from impurities.

1.3 Primer, if required separately for surface compatibility, shall be of approved quality (where specified in related item).

2.0 Workmanship

2.1 Surface Preparation

2.1.1 The wall surface shall be thoroughly cleaned of all mortar droppings, dust, dirt, grease and any other foreign matter.

2.1.2 The surface shall be sand papered smooth to obtain a uniform base for painting.

2.1.3 All cracks, holes and surface defects shall be properly filled and made good before application of paint.

2.2 Application of Paint

2.2.1 Two coats of plastic emulsion paint shall be applied evenly to achieve a smooth, uniform and consistent shade.

2.2.2 Each coat shall be applied only after the previous coat has dried sufficiently.

2.2.3 The paint shall be thoroughly stirred before and during application to maintain uniform consistency.

2.2.4 Application shall be done using brush or roller as approved, ensuring even spreading without patchiness.

2.3 Finishing

2.3.1 The finished surface shall be smooth, uniform in colour and free from brush marks, streaks, patches, peeling or other defects.

2.3.2 Special care shall be taken at corners, edges and junctions to ensure neat and uniform finish.

2.4 Protection

2.4.1 Painted surfaces shall be protected from dust, moisture and damage until fully dried and cured.

2.4.2 Any defective or uneven work shall be rectified at the contractor's own cost.

3.0 Mode of Measurement and Payment

3.1 Measurement shall be made in square metres (m²) of painted wall surface actually completed.

3.2 The rate shall include cost of materials, surface preparation, sand papering, filling of defects, application of two coats of plastic emulsion paint and finishing.

3.3 The rate shall also include labour, tools, scaffolding, wastage, transportation and all incidental charges.

3.4 No extra payment shall be made for minor touch-ups, patches or overlapping work.

3.5 The rate shall be for a unit of One Square Metre (m²).

Item No.10

Excavation for foundation up to 1.5 M. depth including sorting out and stacking of useful materials and disposing of the excavated stuff up to 50 meter lead in loose or soft soil.

1.0. General

1.1. Any soil which generally yields to the application of pickaxes and shovels, phawaras rakes or any such

ordinary excavating implement or organic soil, gravel silt, sand turf loam, clay, peat etc., fall under this category

2.0. Clearing the site

2.1. The site on which the structure is to be built shall be cleared, and all obstructions loose stone, materials and

rubbish of all kind bush wood and trees shall be removed as directed. The materials so obtained shall be property of

the Government and shall be conveyed and stacked as directed within 50 m lead. The roots of the trees coming in the

sides shall be cut and coated with a hot asphalt

2.2. The rate of side clearance is deemed to be included in the rate of earth work for which no extra will be paid.

3.0. Setting out

After clearing the site the centre lines will be given, by the Engineer-in-charge. The contractor shall assume full

responsibility for alignment, elevation and dimension of each and all parts of the work. Contractor shall supply labours

materials, etc. required for setting out the reference marks and bench marks and shall maintain them as long as

required and directed.

4.0. Excavation

The excavation in foundation shall be carried out in true line and level and shall have the width and depth as shown in

the drawings or as directed. The contractor shall do the necessary shoring and shuffling or providing necessary slopes

to a safe angle, at his own cost. The payment for such precautionary measures shall be paid separately if not

specified. The bottom of the excavated area shall be leveled both longitudinally and transversely as directed by

removing and watering as required. No. earth filling will be allowed for bringing it to level. If by mistake or any

excavation is made deeper or wider than, that shown on the plan or directed. The extra depth or width shall be made

up with concrete of same proportion as specified for the foundation concrete at the cost of the contractor. The

excavation up to 1.5 m depth shall be measured under this item.

5.0. Disposal of the excavated stuff

5.1. The excavated stuff of the selected type shall be used in filling the trenches and plinth or leveling the ground

in layers including ramming and watering etc.

5.2. The balance of the excavated quantity shall be removed by the contractor from the site of work to a place as

directed with load up to 50 M. and all lift.

6.0. Mode of measurements & payment

6.1. The measurement of excavation in trenches for foundation shall be made according to the sections of

trenches shown on the drawing or as per sections given by the Engineer-in-charge. No payment shall be made for

surplus excavation made in excess of above requirements or due to stopping and sloping back as found necessary on

account of conditions of soil and requirements of safety.

6.2. The rate shall be for a unit of one cubic meter

Item No.11

Providing and laying cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) and curing complete excluding the cost of form work in foundations and plinth.

1.0. Materials

1.1. Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Stone aggregate 40 mm nominal size shall conform to M-12.

2.0. Workmanship

2.1. General

2.1.1. Before starting concrete work, the bed of foundation trenches shall be cleared of all loose materials, leveled, watered and rammed as directed.

2.2. Proportion of Mix

2.2.1. The proportion of cement, sand and coarse aggregate shall be one part of cement, three parts of sand and six parts of stone aggregate and shall be measured by volume.

2.3. Mixing

2.3.1. The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may, however, be allowed for small quantities of work if approved by the Engineer-in-Charge. When hand mixing is permitted by the Engineer-in-Charge in case of breakdown of machinery and in the interest of work, it shall be carried out on a watertight platform. Care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. In such cases, 10 percent additional cement shall be used. Mixing shall continue for a period of 1½ to 2 minutes. The quantity of water shall be just sufficient to produce dense concrete of the required workability.

2.4. Transporting and Placing the Concrete

2.4.1. The concrete shall be transported from the place of mixing to the final position within 15 minutes by approved means and shall be placed, compacted and finished within 30 minutes of mixing with water, i.e., before the initial setting commences.

2.4.2. The concrete shall be laid in layers of 15 cm to 20 cm thickness.

2.5. Compaction

2.5.1. The concrete shall be rammed with heavy iron rammers rapidly to achieve the required compaction and to ensure that all interstices are completely filled with mortar.

2.6. Curing

2.6.1. After the final set, the concrete shall be kept continuously wet, if required by ponding, for a period of not less than seven days from the date of placement.

2.7. Mode of Measurement and Payment

2.7.1. The concrete shall be measured for its length, breadth and depth, limiting dimensions to those specified on the drawings or as directed by the Engineer-in-Charge.

2.7.2. The rate shall be for a unit of one cubic meter.

Item No.12

Providing form work of ordinary timber planking so as to give a rough finish including centering, strutting and propping etc., height of propping and centering below supporting floor to ceiling not exceeding 4 m and removal of the same for in-situ reinforced concrete and plain concrete work in foundations, footings, bases of columns and mass concrete.

1.0. Materials

1.1. The shuttering to be provided shall be of ordinary timber planking and shall conform to M-26.

1.2. The dimensions of scantlings and battens shall conform to the approved design. The strength of timber shall not be less than that assumed in the design.

2.0. Workmanship

2.1. Form Work

2.1.1. The form work shall conform to the shapes, lines and dimensions shown on the drawings and shall be constructed so as to remain sufficiently rigid during placing and compaction of concrete.

2.1.2. Adequate arrangements shall be made by the contractor to safeguard against settlement of the form work during and after concreting. The form work, shuttering, centering, scaffolding and bracing shall be as per approved design.

2.2. Cleaning and Treatment of Forms

2.2.1. All rubbish, chippings, shavings and sawdust shall be removed from the interior of the forms before placing concrete. The surfaces in contact with concrete shall be cleaned thoroughly and wetted before concreting.

2.2.2. The form surfaces shall be coated with soap solution before concreting. The soap solution shall be prepared by dissolving yellow soap in water to obtain paint-like consistency. Alternatively, a coat of raw linseed oil may be applied after thoroughly cleaning the surface.

2.2.3. Care shall be taken to ensure that the coating does not come into contact with construction joints or reinforcement bars.

2.3. Stripping Time

2.3.1. In normal circumstances and where ordinary Portland cement is used, forms may be removed after the following periods:

(a) Sides of walls, columns and vertical faces of beams – **24 to 48 hours**

(b) Beam soffits (props left under) – **7 days**

(c) Removal of props to slabs:

- (i) Slabs spanning up to 4.5 m – **7 days**
- (ii) Slabs spanning over 4.5 m – **14 days**

(d) Removal of props to beams and arches:

- (i) Spanning up to 6 m – **14 days**
- (ii) Spanning over 6 m – **21 days**

2.4. Procedure for Removal of Form Work

2.4.1. All form work shall be removed carefully without shock or vibration which may damage the concrete.

2.4.2. Before removing soffit forms and props, the concrete surface shall be exposed where necessary to ascertain that the concrete has attained sufficient strength.

2.5. Centering

2.5.1. The centering shall be got approved before use. It shall be sufficiently strong to ensure safety of form work and concrete before, during and after placing concrete.

2.5.2. Continuous observation shall be maintained during concreting to ensure satisfactory performance of centering and form work.

2.5.3. The props shall rest on firm foundations or bases of adequate strength to carry all imposed loads without settlement.

2.5.4. The centering and form work shall be inspected and approved by the Engineer-in-Charge before concreting. Such approval shall not relieve the contractor of responsibility for adequacy, strength and safety of the form work.

2.5.5. In the event of failure of form work or centering, the contractor shall be responsible for all damages.

2.6. Scaffolding

2.6.1. All scaffolding, hoisting arrangements and ladders required for execution of the work shall be provided, maintained and removed by the contractor at his own cost.

2.6.2. The scaffolding, hoisting arrangements and ladders shall be strong enough to withstand all dead, live and impact loads and shall be subject to approval by the Engineer-in-Charge.

2.6.3. The contractor shall be solely responsible for the safety of scaffolding, hoisting arrangements, ladders, workmen and work.

2.6.4. The scaffolding and access arrangements shall permit easy approach to the work and facilitate inspection.

2.6.5. The rate shall include all conditions of working up to a height of 4 m and shall include the cost of materials and labour for:

(a) Splayed edges, notching, overlaps, passing at angles, battens, centering, shuttering, propping, bolting, wedging, easing, striking and removal.

(b) Fillets for forming stop chamfers and splayed external angles not exceeding 20 mm width to beams, columns and similar members.

(c) Temporary openings in forms for placing concrete and removal of rubbish.

(d) Oiling or other approved treatment to prevent adhesion of concrete to shuttering.

(e) Raking or circular cutting wherever required.

2.7. Re-use of Forms

2.7.1. Before re-use, all forms shall be inspected by the Engineer-in-Charge and their suitability determined.

2.7.2. Forms shall be scraped, cleaned and repaired where necessary. Joints shall be made good and internal surfaces retreated to prevent adhesion of concrete.

3.0. Mode of Measurements and Payment

3.1. Form work shall be measured as the area in square meters of shuttering in contact with concrete, except in the case of inclined members, curved profiles and upper surfaces, where the area of the underside shall be measured.

3.2. Form work to secondary beams shall be measured up to the sides of main beams. No deduction shall be made from the form work of the main beam at intersections.

3.3. No deduction shall be made from the form work of columns at beam intersections.

3.4. The rate shall be for the completed item including all labour, materials, equipment and incidental charges.

3.5. The rate shall be for a unit of one square meter.

Item No.13

Providing and laying cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) and curing complete excluding the cost of form work in (A) foundation and plinth, (B) independent piers, columns and pillars up to floor two level.

1.0. Materials

1.1. Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Grit shall conform to M-8. Graded stone aggregate 20 mm nominal size shall conform to M-12.

2.0. General

2.1. The concrete mix shall be of nominal proportion 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) by volume. The concrete work shall have exposed concrete surfaces or as specified in the item.

2.2. The designation of ordinary concrete mixes shall approximately correspond to the following nominal mixes by volume:

Grade Nominal Mix

M-100 1:3:6

M-150 1:2:4

M-200 1:1½:3

M-250 1:1:2

2.3. The quantity of materials and water-cement ratio shall conform to the relevant specifications and approved mix proportions.

2.4. The water-cement ratio shall not exceed the specified limits. If additional water is required for workability, cement content shall be increased correspondingly to maintain the specified water-cement ratio.

2.5. Workability shall be controlled by maintaining a water-cement ratio that produces concrete sufficiently workable for proper placing and compaction without segregation.

2.6. The maximum size of coarse aggregate shall not exceed one-fourth of the minimum thickness of the member and shall be such that concrete can be placed and compacted without difficulty.

2.7. For reinforced concrete work, coarse aggregate of 20 mm nominal size shall generally be used.

2.8. For heavily reinforced members, the nominal maximum size of aggregate shall be restricted to 5 mm less than the minimum clear spacing between reinforcement bars or minimum cover, whichever is smaller.

2.9. Where reinforcement is widely spaced, larger aggregate sizes may be permitted subject to the approval of the Engineer-in-Charge.

2.10. Admixtures may be used only with the approval of the Engineer-in-Charge and shall not adversely affect the strength, durability or bond characteristics of concrete.

3.0. Workmanship

3.1. Proportioning

3.1.1. Proportioning shall be carried out by volume. Cement shall be measured in bags of 50 kg each, one bag being taken as 0.0342 cubic meter. Approved gauge boxes shall be used for measuring sand and aggregate.

3.1.2. Sand shall be measured on the basis of dry volume and suitable allowance shall be made for bulking of damp sand.

3.2. Mixing

3.2.1. Concrete shall be mixed in a mechanical mixer maintained in first-class working condition. Measured quantities of aggregate, sand and cement shall be mixed dry before adding water. Mixing shall continue until a uniform colour and consistency are obtained and in no case for less than two minutes after all materials have been added.

3.2.2. Hand mixing may be permitted by the Engineer-in-Charge for small works or special circumstances. Such mixing shall be carried out on a clean watertight platform. Ten percent additional cement shall be added over the specified quantity.

3.2.3. Mixers remaining idle for more than thirty minutes shall be thoroughly cleaned before reuse.

3.3. Consistency

3.3.1. Workability shall be determined by slump tests in accordance with relevant Indian Standards. Slump shall generally be 10 mm to 25 mm for vibrated concrete and up to 80 mm where vibration is not used.

3.4. Inspection

3.4.1. Adequate notice shall be given to the Engineer-in-Charge before concreting so that form work, centering and reinforcement can be inspected and approved.

3.4.2. One carpenter with helper shall remain present throughout concreting operations. Suitable platforms shall be provided to prevent disturbance of reinforcement.

3.5. Transporting and Laying

3.5.1. Concrete shall be transported and placed without segregation, contamination or loss of materials.

3.5.2. Concrete shall be placed continuously between construction joints and compacted within thirty minutes of mixing with water.

3.5.3. Concrete shall be deposited in layers not exceeding 450 mm when internal vibrators are used and 300 mm in other cases.

3.5.4. Concrete shall not be dropped from a height exceeding 2 meters unless otherwise approved.

3.5.5. Where concreting is resumed on hardened surfaces, the surface shall be roughened, cleaned, wetted and treated with cement mortar or grout before placing fresh concrete.

3.5.6. Concrete shall be compacted using mechanical vibrators unless otherwise permitted by the Engineer-in-Charge.

3.6. Curing

3.6.1. Immediately after compaction, the concrete shall be protected from adverse weather conditions, shocks and vibration.

3.6.2. After initial setting, the concrete shall be covered with wet hessian or similar approved material and kept continuously moist for not less than fourteen days.

3.6.3. Masonry work over foundation concrete may commence after forty-eight hours, but curing shall continue for the specified period.

3.7. Sampling and Testing

3.7.1. Sampling and testing of concrete shall be carried out in accordance with relevant Indian Standards and as directed by the Engineer-in-Charge.

3.7.2. Test cubes shall be prepared, cured and tested at seven days and twenty-eight days intervals.

3.7.3. The strength of concrete shall satisfy the acceptance criteria specified in relevant Indian Standards.

3.8. Stripping

3.8.1. Form work shall not be removed until the concrete has attained adequate strength and approval has been obtained from the Engineer-in-Charge.

3.8.2. Form work shall be removed carefully without causing damage to the concrete.

3.8.3. Defects such as honeycombing, cavities and surface irregularities shall be repaired immediately after removal of forms to the satisfaction of the Engineer-in-Charge.

4.0. Mode of Measurement and Payment

4.1. Concrete work shall be measured in cubic meters based on the net dimensions shown on the drawings or as directed.

4.1.1. No deduction shall be made for embedded ends of beams, posts, girders, rafters, purlins, trusses, corbels, steps and similar members up to 500 sq.cm in cross-sectional area.

4.2. The rate shall include the cost of all materials, labour, tools, plants, mixing, transporting, placing, vibrating, compacting, finishing, curing, testing and all incidental expenses necessary to complete the work. The rate excludes the cost of form work.

4.3. The rate shall be for a unit of one cubic meter.

Item No.14

Filling in foundation and plinth with murrum or selected soil in layers of 20 cm thickness including watering, ramming and consolidating etc., complete.

1.0. Materials

1.1. Murrum shall be clean, of good binding quality and of approved quality obtained from approved pits/quarries of disintegrated rock containing siliceous material and natural mixtures of clay of detrital origin. The size of murrum shall not exceed 20 mm.

2.0. Workmanship

2.1. The relevant specifications of Item No. 4.12 shall be followed except that murrum or selected soil shall be filled in foundations and plinths in layers not exceeding 20 cm thickness.

2.2. Each layer shall be watered adequately and compacted thoroughly by ramming to obtain the required density and stability.

2.3. Filling shall be carried out in uniform layers including spreading, dressing, watering, ramming and consolidating complete as directed by the Engineer-in-Charge.

2.4. The finished surface shall be properly leveled and dressed to the required lines, grades and levels.

3.0. Mode of Measurements and Payment

3.1. The rate shall include the cost of collecting, loading, transporting and unloading approved murrum or selected soil with all leads and lifts, including labour required for filling, watering, ramming, consolidating and dressing complete.

3.3. The rate shall be for a unit of one cubic meter.

Item No.15

Providing and Fixing Precast Rubber Dye / Steel Dye Interlocking Concrete Block 60 mm Thick with M300 Grade Concrete, Pneumatic Compressed / Mechanically Vibrated, Confirming to IS 15658:2006 Including 35 mm Sand Layer for Leveling and Joint Filling with Sand as per IRC:SP:63-2018 Complete.

1.0 Materials

1.1 The interlocking concrete blocks shall be factory manufactured using M300 grade concrete by pneumatic compression and mechanical vibration process.

1.2 The precast concrete blocks shall conform to IS 15658:2006 and shall be of approved make, design, shape, colour and size as approved by the Engineer-in-Charge.

1.3 The thickness of the interlocking concrete blocks shall be 60 mm unless otherwise specified in the drawings.

1.4 The bedding sand shall be clean, well graded, free from clay, organic matter and other impurities and shall be of approved quality.

1.5 The joint filling sand shall be clean and suitable for filling the joints between concrete blocks.

2.0 Workmanship

2.1 Preparation of Surface

2.1.1 The area where interlocking concrete blocks are to be laid shall be prepared to the required line, level, slope and profile as per drawings or as directed by the Engineer-in-Charge.

2.1.2 The surface shall be properly cleaned, leveled and compacted before laying the bedding sand.

2.1.3 Any depression, unevenness or loose material shall be removed and corrected before commencement of paving work.

2.2 Laying of Sand Bedding Layer

2.2.1 A uniform layer of 35 mm thick sand shall be provided over the prepared surface for leveling and bedding of concrete blocks.

2.2.2 The sand layer shall be properly leveled and maintained to achieve the required line, level and slope.

2.2.3 The bedding layer shall provide uniform support to the entire bottom surface of the concrete blocks.

2.3 Fixing of Interlocking Concrete Blocks

2.3.1 The precast interlocking concrete blocks shall be laid carefully over the prepared sand bedding in the approved pattern and arrangement.

2.3.2 The blocks shall be placed tightly with proper interlocking arrangement and maintained in correct line, level and alignment.

2.3.3 The laying work shall be carried out as per guidelines of IRC:SP:63-2018 and as directed by the Engineer-in-Charge.

2.3.4 Necessary cutting of blocks at edges, corners and around obstructions shall be carried out accurately without damaging the blocks.

2.4 Joint Filling and Compaction

2.4.1 After laying of concrete blocks, all joints shall be completely filled with clean dry sand.

2.4.2 The paved surface shall be compacted using suitable mechanical vibrator/plate compactor to achieve proper seating and interlocking of blocks.

2.4.3 Additional sand shall be spread and brushed into joints until all joints are properly filled.

2.4.4 The finished surface shall be uniform, stable and free from unevenness or displacement.

2.5 Protection

2.5.1 The completed paving work shall be protected from damage until it is ready for use.

2.5.2 Any damaged, broken or defective blocks shall be removed and replaced by the contractor at his own cost.

3.0 Mode of Measurement and Payment

3.1 Measurement shall be taken for the actual area of interlocking concrete blocks laid and completed at site.

3.2 No extra payment shall be made for cutting of blocks, wastage, joint filling sand, leveling sand layer and minor adjustments required for proper laying.

3.3 The rate shall include the cost of all materials, labour, transportation, handling, surface preparation, sand bedding layer, laying, joint filling, compaction, finishing, tools, equipment and all incidental charges required for satisfactory completion of work.

3.4 The work shall be executed as per IS 15658:2006 and IRC:SP:63-2018 guidelines.

3.5 The rate shall be for a unit of **One Square Meter (Sq. M.)**.

Item No.16

Pre cast concrete kerb Providing & fixing M30 grade of concrete factory made precast exposed/ fair finish kerb stones of approved make and as per sample approved of any sizes, any shape. Kerbs shall be fixed on the foundation prepared of M15 grade concrete as of approved design including excavation, curing, formwork (if required), flush pointing in CM (1:2) for all joints of the kerbstones etc. complete. The rate shall also include for erecting and fixing the pieces in position for complete kerb systems with Chamfered type/ pencil corner kerbs including necessary accessories of kerb like radius kerbs, corner kerb, quadrant kerbs, drain out kerb, flat kerb, parking edge kerb, ramp kerb, etc complete as per drawing. Precast kerb shall be protect with good quality plastic sheet for protection against bituminous/ concrete work. The rate shall include the cost of base excavation, base PCC M15 grade, joining, curing, protection etc complete as directed by engineer in charge. Rate shall be unit of One Cum. For the payment, kerb volume shall be considered. (Sample must be approved).

1.0 Materials

1.1 Precast kerb stones shall be factory manufactured using **M30 grade concrete** with exposed/fair finish surface and shall be of approved make and quality.

1.2 The size, shape, profile and finish of kerb stones shall be as per approved drawings and sample approved by the Engineer-in-Charge.

1.3 Concrete for foundation below kerb stones shall be **M15 grade concrete** and shall conform to relevant specifications.

1.4 Cement mortar for jointing and flush pointing shall be **C.M. 1:2 (1 cement : 2 fine sand)** and shall conform to relevant specifications.

1.5 All materials including cement, sand, concrete and other accessories shall be of approved quality.

2.0 Workmanship

2.1 Setting Out and Excavation

2.1.1 The alignment, levels and location of kerbs shall be marked as per approved drawings and instructions of the Engineer-in-Charge.

2.1.2 Excavation shall be carried out to the required width, depth and profile for providing the kerb foundation.

2.1.3 The excavated surface shall be cleaned, leveled, watered and properly compacted before laying foundation concrete.

2.2 Foundation Concrete

2.2.1 A foundation bed of **M15 grade concrete** shall be provided below the precast kerb stones as per approved design and required dimensions.

2.2.2 The concrete foundation shall be properly laid, compacted and finished to the required level before fixing kerb stones.

2.2.3 The foundation concrete shall be cured adequately as per specifications.

2.3 Fixing of Precast Kerb Stones

2.3.1 Precast kerb stones shall be carefully transported, handled and fixed over the prepared foundation in proper line, level and alignment.

2.3.2 Kerb stones shall be erected and fixed firmly to form a complete kerb system as per approved drawings.

2.3.3 All joints between kerb stones shall be properly filled and flush pointed with cement mortar 1:2.

2.3.4 The following types of kerbs shall be provided wherever required as per drawings:

- Chamfered type kerbs
- Pencil corner kerbs
- Radius kerbs
- Corner kerbs
- Quadrant kerbs
- Drain out kerbs
- Flat kerbs
- Parking edge kerbs
- Ramp kerbs

2.3.5 The completed kerb line shall be uniform, properly aligned and free from unevenness or displacement.

2.4 Protection and Curing

2.4.1 Precast kerb stones shall be protected with good quality plastic sheets during adjoining bituminous or concrete works to prevent staining and damage.

2.4.2 The kerbs and foundation concrete shall be properly cured after completion of work.

2.4.3 Any damaged or defective kerb stones shall be replaced by the contractor at his own cost.

3.0 Mode of Measurement and Payment

3.1 The measurement of precast concrete kerbs shall be taken based on the actual volume of kerb stones fixed in position.

3.2 For payment, the volume of kerb stones shall be considered.

3.3 The rate shall include the cost of:

- Providing and fixing M30 grade precast concrete kerb stones.
- Approval of sample and required finish.
- Excavation for kerb foundation.
- Providing M15 grade PCC foundation.
- Formwork wherever required.
- Transportation, handling and fixing of kerb stones.
- Joint filling and flush pointing in C.M. 1:2.
- Curing and protection of kerbs.
- Providing all types of kerb accessories.
- Labour, tools, equipment and all incidental charges required for completion.

3.4 The work shall be completed as per approved drawings and directions of the Engineer-in-Charge.

3.5 The rate shall be for a unit of **One Cubic Meter (Cum)**.

Item No.17

Dismantling tiled or stone floors laid in mortar including stacking of serviceable materials and disposal of unserviceable materials with all leads and lifts.

1.0. Workmanship

1.1. The relevant specifications of Item No. 20.1 (i) shall be followed except that dismantling of tiled or stone floors laid in mortar shall be carried out.

1.2. Dismantling shall imply carefully taking up, removing or taking down the existing tiled or stone flooring without causing unnecessary damage to the serviceable materials.

1.3. The materials shall be removed carefully and passed by hand wherever necessary. Serviceable materials shall be lowered carefully and stacked neatly at places directed by the Engineer-in-Charge.

1.4. Where tiles or stones are fixed with nails, screws, bolts, clamps or similar fasteners, such fasteners shall be removed using proper tools without damaging the reusable materials.

1.5. Unserviceable materials, debris and rubbish arising out of dismantling operations shall be removed and disposed of as directed with all leads and lifts.

2.0. Mode of Measurements and Payment

2.1. Supporting members such as joists, beams or other structural elements, if dismantled separately, shall be measured and paid under the relevant items. The relevant specifications of Item No. 20.1 (i) shall otherwise apply.

2.2. The rate shall include dismantling, sorting, stacking of serviceable materials, removal and disposal of unserviceable materials, and all labour, tools, plants, leads and lifts required for completion of the work.

2.3. The rate shall be for a unit of one square meter.

Item No.18

Providing and Fixing Precast RCC Traffic Control Bollards of Approved Design Including Excavation, Foundation, Transportation, Erection, Alignment, Finishing and Painting Complete.

1.0 Materials

1.1 Precast RCC traffic control bollards shall be of approved design, size, shape and quality as per the requirements of the Engineer-in-Charge.

1.2 The concrete used for manufacturing RCC bollards shall be of approved grade and shall conform to relevant specifications.

1.3 Reinforcement steel used in RCC bollards shall conform to relevant IS specifications and shall be properly placed as per approved design.

1.4 Paint shall be of approved quality, brand and shade suitable for external exposure conditions.

1.5 All materials including cement, aggregate, reinforcement, paint and other accessories shall be approved by the Engineer-in-Charge before use.

2.0 Workmanship

2.1 Setting Out and Excavation

2.1.1 The location and alignment of traffic control bollards shall be marked as per approved drawings and instructions of the Engineer-in-Charge.

2.1.2 Excavation shall be carried out at required locations for fixing the bollards including removal of loose soil and preparation of foundation bed.

2.1.3 The foundation area shall be cleaned, leveled and compacted before erection of bollards.

2.2 Foundation and Fixing

2.2.1 The foundation for RCC bollards shall be provided as per approved design and site requirements.

2.2.2 Precast RCC bollards shall be carefully transported, unloaded and handled to prevent damage during shifting and installation.

2.2.3 The bollards shall be erected vertically in proper line, level and alignment as directed by the Engineer-in-Charge.

2.2.4 The bollards shall be firmly fixed in the foundation using approved method to ensure stability and durability.

2.2.5 Any gap around the foundation shall be properly filled and compacted to achieve firm fixing.

2.3 Finishing and Painting

2.3.1 The exposed surface of RCC bollards shall be properly finished and cleaned before painting.

2.3.2 Two coats of approved quality paint shall be applied uniformly over the bollard surface.

2.3.3 Painting shall provide an even shade and smooth finish without patches, brush marks or uneven coating.

2.3.4 The colour and pattern of painting shall be as approved by the Engineer-in-Charge and as per site requirements.

2.4 Protection and Completion

2.4.1 The completed bollards shall be protected from damage until the completion of adjoining works.

2.4.2 All works shall be executed carefully maintaining proper spacing, alignment and appearance of the traffic control system.

2.4.3 The contractor shall provide all labour, tools, equipment and materials required for complete installation.

3.0 Mode of Measurement and Payment

3.1 The measurement shall be taken for the number of precast RCC traffic control bollards supplied and fixed at site complete in all respects.

3.2 The rate shall include the cost of:

- Supply of precast RCC traffic control bollards.
- Loading, unloading and transportation.
- Handling and shifting at site.
- Excavation for foundation.
- Providing foundation and fixing arrangements.
- Erection, alignment and leveling.
- Surface finishing.
- Applying two coats of approved paint.
- Labour, tools, equipment and all incidental charges required for satisfactory completion.

3.3 The work shall be completed as per approved drawings, specifications and instructions of the Engineer-in-Charge.

3.4 The rate shall be for a unit of **One Number (Each)**.

Item No.19

Providing and Fixing Cautionary Warning Sign Boards Made of Aluminium Sheet with Reflective Sheeting, Supporting Frame, Painting and Complete Installation as per IRC Specifications.

1.0 Materials

1.1 Cautionary warning sign boards shall be fabricated from **2 mm thick aluminium sheet** of approved quality and shall conform to the design and specifications of **IRC-67-1977**.

1.2 The sign board shall be of **90 cm × 90 cm × 90 cm equilateral triangular shape** as per approved design.

1.3 The aluminium sheet shall be pre-treated by **phosphating process and acid etching** to ensure proper adhesion of coatings.

1.4 The sign board shall be coated with:

- One coat of approved quality epoxy primer.
- Two coats of best quality epoxy paint.

1.5 The sign face shall be reflectorised using approved **retro-reflective sheeting** conforming to the latest specifications of **M.O.S.T.**

1.6 The supporting post and frame shall be fabricated from suitable size steel angles as required, including:

- 35 mm × 35 mm × 3 mm angle.
- 75 mm × 75 mm × 6 mm angle.

1.7 The supporting frame and post shall be painted with approved quality epoxy coating in **black and white bands**.

1.8 Concrete foundation block shall be provided using **C.C. 1:2:4 mix** of size **45 cm × 45 cm × 60 cm for each leg**.

2.0 Workmanship

2.1 Fabrication of Sign Board

2.1.1 The cautionary warning sign board shall be fabricated accurately as per approved drawings, IRC specifications and instructions of the Engineer-in-Charge.

2.1.2 The triangular sign board shall have smooth edges and proper finishing without distortion, dents or surface defects.

2.1.3 The symbols, letters and markings on each sign board shall be provided as per approved design and instructions of the Engineer-in-Charge.

2.2 Surface Treatment and Painting

2.2.1 The aluminium sheet surface shall be thoroughly cleaned and treated by phosphating and acid etching process before applying coatings.

2.2.2 Epoxy primer shall be applied uniformly over the prepared surface.

2.2.3 Two coats of approved quality epoxy paint shall be applied to achieve uniform finish and durability.

2.2.4 The reflective sheeting shall be fixed properly without wrinkles, bubbles or loose edges.

2.3 Post and Frame Fixing

2.3.1 The supporting post and frame shall be fabricated from approved size steel angles and fixed firmly to the sign board.

2.3.2 The complete assembly shall be erected at site in proper line, level and vertical alignment.

2.3.3 The steel post and frame shall be painted with epoxy coating in approved black and white bands.

2.4 Foundation and Installation

2.4.1 Excavation shall be carried out at the required location for fixing the sign post foundation.

2.4.2 The sign post shall be fixed in **C.C. 1:2:4 foundation block of size 45 cm × 45 cm × 60 cm for each leg.**

2.4.3 The concrete foundation shall be properly compacted, finished and cured as per specifications.

2.4.4 The complete sign board installation shall be checked for stability, alignment and visibility from the required approach direction.

2.5 Protection and Completion

2.5.1 The completed sign board shall be protected from damage during execution of other works.

2.5.2 All materials, labour, tools, equipment and transportation required for complete installation shall be provided by the contractor.

2.5.3 The work shall be carried out under the supervision and approval of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

3.1 The measurement shall be taken for the number of cautionary warning sign boards supplied and fixed completely at site.

3.2 The rate shall include the cost of:

- Providing 2 mm thick aluminium sign board.
- Phosphating and acid etching treatment.
- Epoxy primer and epoxy painting.
- Retro-reflective sheeting as per M.O.S.T. specifications.
- Fabrication of supporting post and frame.
- Painting of steel frame with epoxy coating.
- Excavation for foundation.
- Providing C.C. 1:2:4 foundation blocks.
- Fixing, alignment and curing.

- Transportation, handling, labour, tools and equipment.
- All incidental charges required for satisfactory completion.

3.3 The rate shall be for a unit of **One Number (Each)**.

Item No.20

Providing and Fixing Informatory Sign Boards Made of Aluminium Sheet with Reflective Sheeting, Supporting Frame, Painting and Complete Installation as per IRC Specifications.

1.0 Materials

1.1 Informatory sign boards shall be fabricated from **2 mm thick aluminium sheet** of approved quality and shall conform to the requirements of **IRC-67-1977** and relevant M.O.S.T. specifications.

1.2 The sign board shall be of **80 cm × 60 cm rectangular size** unless otherwise specified in the drawings or directed by the Engineer-in-Charge.

1.3 The aluminium sheet shall be pre-treated by **phosphating and acid etching process** before application of primer and paint.

1.4 The sign board shall be coated with:

- One coat of approved epoxy primer.
- Two coats of best quality epoxy paint.

1.5 The sign face shall be reflectorised with approved **retro-reflective sheeting** conforming to the latest M.O.S.T. specifications.

1.6 The supporting post and frame shall be fabricated from approved steel angles of suitable size including:

- 35 mm × 35 mm × 3 mm angle.
- 75 mm × 75 mm × 6 mm angle.

or as required by the approved design.

1.7 The supporting frame and posts shall be painted with approved epoxy coating in **black and white bands**.

1.8 Concrete foundation blocks shall be of **C.C. 1:2:4 mix** and shall be of size **45 cm × 45 cm × 60 cm for each leg**.

2.0 Workmanship

2.1 Fabrication of Sign Board

2.1.1 The informatory sign board shall be fabricated accurately to the dimensions, shape and details shown in approved drawings and as per IRC specifications.

2.1.2 The board shall be free from dents, distortions, sharp edges and other defects.

2.1.3 The lettering, symbols, arrows and other information displayed on the sign board shall be as approved by the Engineer-in-Charge.

2.2 Surface Preparation and Painting

2.2.1 The aluminium sheet shall be thoroughly cleaned and treated by phosphating and acid etching process prior to painting.

2.2.2 One coat of epoxy primer shall be applied uniformly over the treated surface.

2.2.3 Two coats of approved epoxy paint shall be applied to obtain a smooth, durable and uniform finish.

2.2.4 Retro-reflective sheeting shall be fixed properly on the sign face without wrinkles, bubbles or visible defects.

2.3 Fabrication of Supporting Frame

2.3.1 The supporting frame and post assembly shall be fabricated from approved steel angle sections and securely connected to the sign board.

2.3.2 All welds, joints and connections shall be neat, sound and properly finished.

2.3.3 The steel frame and posts shall be painted with approved epoxy coating in alternate black and white bands.

2.4 Erection and Fixing

2.4.1 Excavation shall be carried out for foundation blocks at the locations shown on drawings or as directed by the Engineer-in-Charge.

2.4.2 The sign board assembly shall be erected in true line, level and plumb position.

2.4.3 The supporting posts shall be fixed securely in **C.C. 1:2:4 foundation blocks of size 45 cm × 45 cm × 60 cm for each leg.**

2.4.4 The concrete shall be properly compacted, finished and cured as per specifications.

2.4.5 After installation, the sign board shall be checked for stability, alignment and visibility from the intended direction of traffic movement.

2.5 Protection and Completion

2.5.1 The completed sign board shall be protected from damage during execution of adjacent works.

2.5.2 Any damage occurring during transportation, erection or construction shall be rectified or replaced by the contractor at his own cost.

2.5.3 The entire work shall be executed under the supervision and approval of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

3.1 The measurement shall be taken for the number of informatory sign boards supplied, erected and fixed complete in all respects.

3.2 The rate shall include the cost of:

- Providing 2 mm thick aluminium sign board.
- Phosphating and acid etching treatment.

- Epoxy primer and epoxy painting.
- Retro-reflective sheeting.
- Fabrication and painting of steel supporting frame and posts.
- Excavation for foundation.
- Providing C.C. 1:2:4 foundation blocks.
- Erection, fixing, alignment and curing.
- Transportation, handling, labour, tools and equipment.
- All incidental charges required for satisfactory completion of the work.

3.3 The work shall be carried out as per IRC-67-1977, latest M.O.S.T. specifications and instructions of the Engineer-in-Charge.

3.4 The rate shall be for a unit of **One Number (Each)**.

Item No.21

Providing, Supplying and Fixing MS Hanging Garbage Dustbin of Approved Design and Capacity Complete with Supporting Frame, Painting and Installation.

1.0 Materials

1.1 The hanging garbage dustbin shall be fabricated from approved quality **Mild Steel (MS) sheets and MS sections** conforming to relevant IS specifications.

1.2 The dustbin shall be of approved design, shape and storage capacity as specified in the drawings or as approved by the Engineer-in-Charge.

1.3 The supporting frame, brackets and other structural components shall be fabricated from suitable MS sections capable of safely supporting the dustbin under service conditions.

1.4 All nuts, bolts, washers, welding electrodes and fixing accessories shall be of approved quality and suitable for the intended application.

1.5 Primer and synthetic enamel paint shall be of approved brand, colour and quality suitable for outdoor use.

2.0 Workmanship

2.1 Fabrication

2.1.1 The MS hanging garbage dustbin shall be fabricated to the approved design and dimensions using MS sheets and sections.

2.1.2 The dustbin body shall be neatly formed, properly welded and free from dents, cracks, sharp edges and other defects.

2.1.3 All joints shall be continuously welded and finished smooth to provide adequate strength and durability.

2.1.4 The supporting frame, brackets and hanging arrangements shall be fabricated accurately and securely connected to the dustbin body.

2.2 Surface Preparation

2.2.1 All steel surfaces shall be thoroughly cleaned and prepared before painting.

2.2.2 The surfaces shall be made free from rust, mill scale, oil, grease, dust, welding slag and other foreign matter by wire brushing, scraping and cleaning.

2.2.3 After cleaning, all exposed metal surfaces shall receive one coat of approved metal primer.

2.3 Painting

2.3.1 After the primer coat has dried completely, two coats of approved synthetic enamel paint shall be applied.

2.3.2 The paint shall be applied uniformly to obtain a smooth, durable and even finish free from brush marks, runs or patches.

2.3.3 The colour and finish of paint shall be as approved by the Engineer-in-Charge.

2.4 Transportation and Fixing

2.4.1 The fabricated dustbin and supporting frame shall be carefully transported to the site without causing damage.

2.4.2 The dustbin shall be erected and fixed in the approved position and alignment as directed by the Engineer-in-Charge.

2.4.3 Fixing shall be carried out using approved fasteners, anchor bolts, clamps or other suitable methods to ensure stability and safety.

2.4.4 All nuts, bolts and welded connections shall be properly tightened and finished after installation.

2.5 Protection and Completion

2.5.1 The completed dustbin shall be protected from damage until final acceptance of the work.

2.5.2 Any damaged paintwork or defective components shall be repaired or replaced by the contractor at no extra cost.

2.5.3 The work shall be completed in all respects to the satisfaction of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

3.1 The measurement shall be taken for the number of MS hanging garbage dustbins supplied, fabricated and fixed complete in position.

3.2 The rate shall include the cost of:

- Supply of MS sheets and MS sections.
- Fabrication of dustbin body and supporting frame.
- Welding, cutting, drilling and finishing.
- Nuts, bolts, washers and fixing accessories.

- Surface preparation.
- One coat of metal primer.
- Two coats of synthetic enamel paint.
- Transportation, loading and unloading.
- Erection, fixing and alignment.
- Labour, tools, equipment and all incidental charges required for satisfactory completion of the work.

3.3 The work shall be executed as per approved drawings and instructions of the Engineer-in-Charge.

3.4 The rate shall be for a unit of **One Number (Each)**.

Item No.22

Painting one coats (excluding priming coat) on previously painted steel and other metal surface with enamel paint, brushing to give an even shade including cleaning the surface of all dirt, dust and other foreign matter

1.0. Materials

1.1. The ready mixed priming paint, brushing red lead, shall conform to I.S. 102-1962.

1.2. The thinner (linseed oil) shall conform to I.S. 75-1973. If, for any reason, thinning is necessary in the case of ready mixed paint, the brand of thinner recommended by the manufacturer shall be used.

2.0. Workmanship

2.1. Preparation of Surface

2.1.1. The surfaces to be painted shall be cleaned of all rust, scale, dirt and other foreign matter by means of wire brushes, steel wool, scrapers, sand paper, etc.

2.1.2. The surface shall then be wiped with mineral turpentine to remove grease and hand marks and shall be allowed to dry completely before priming.

2.2. Application of Primer

2.2.1. Immediately after preparation of the surface, the priming coat shall be applied. The paint shall be applied evenly and smoothly by means of crossing and laying off. Crossing and laying off shall consist of covering the area with paint, brushing alternately in opposite directions two or three times and finally brushing lightly in a direction at right angles to the previous strokes. The full process of crossing and laying off shall constitute one coat.

2.2.2. During painting, after the priming coat has been worked out of the brush bristles, the bristles shall be opened by striking the brush against an unpainted surface with the ends of the bristles held at right angles to the surface. The priming coat shall be allowed to dry completely before further painting is commenced.

2.2.3. No brush marks, hair marks, or clogging of paint puddles in corners, panels, angles of mouldings or similar locations shall be left on the finished surface.

2.2.4. Special care shall be taken while painting over bolts, nuts, rivets, overlaps and similar projections.

2.2.5. Paint containers shall be kept closed when not in use and protected from dust and air to prevent thickening of the paint.

3.0. Mode of Measurements and Payment

3.1. New steel and other metal surfaces shall be measured under this item.

3.2. All work shall be measured net in the metric system as executed subject to the following:

(a) Dimensions shall be measured to the nearest 0.01 meter.

(b) Areas shall be worked out to the nearest 0.01 square meter.

3.3. No deduction shall be made for openings not exceeding 0.5 square meter each and no addition shall be made for painting to beading, mouldings, edges, jambs, soffits, sills, etc. of such openings.

3.4. In the case of fabricated structural steel and iron work, the priming coat shall be included with fabrication. In case of trusses measured in square meters, compound girders, stanchions, lattices, girders and similar work, actual area shall be measured and no extra payment shall be made for painting bolts, nuts, washers and similar fittings. No addition shall be made to the weight of steel and iron work for paint applied either in the shop or at site.

3.5. Different surfaces shall be grouped into one general item. Areas of uneven surfaces shall be converted into equivalent plain areas in accordance with Annexure-II for payment purposes.

3.6. The rate shall be for a unit of one square meter.

Item No.23

Providing, Supplying, Erecting, Testing and Commissioning 500W Solar LED Street Light Complete with Solar Photovoltaic Panel, Lithium Battery, Automatic Control System and Mounting Accessories.

1.0 Materials

1.1 The Solar LED Street Light shall be of approved make and shall consist of a **500W LED luminaire** with high power white LEDs suitable for outdoor roadway and area lighting applications.

1.2 The luminaire housing shall be fabricated from corrosion-resistant material and shall be provided with **IP65 or higher weatherproof protection**.

1.3 The Solar Photovoltaic (SPV) panel shall be of approved quality, capacity and efficiency suitable for charging the battery and operating the lighting system under local climatic conditions.

1.4 The battery shall be a **Lithium Battery** of suitable voltage and capacity capable of providing uninterrupted operation as per design requirements.

1.5 The luminaire shall be provided with an integrated controller, automatic dusk-to-dawn operation system, motion sensor and remote-control facility.

1.6 The mounting brackets, clamps, fasteners, hardware and accessories shall be of galvanized steel, stainless steel or other approved corrosion-resistant materials.

1.7 All electrical and electronic components shall conform to relevant IS standards and manufacturer's specifications.

2.0 Workmanship

2.1 Supply and Inspection

2.1.1 All components including LED luminaire, solar panel, battery, controller, motion sensor, remote control and mounting accessories shall be supplied complete and shall be inspected and approved before installation.

2.1.2 The equipment shall be free from manufacturing defects, physical damage and performance deficiencies.

2.2 Installation and Erection

2.2.1 The Solar LED Street Light shall be erected at the locations shown on the drawings or as directed by the Engineer-in-Charge.

2.2.2 The solar panel shall be mounted securely and oriented to receive maximum solar radiation.

2.2.3 The LED luminaire shall be fixed firmly on the mounting arrangement at the specified height and angle to provide uniform illumination.

2.2.4 The lithium battery, controller and associated electrical components shall be securely housed and protected against weather, dust, moisture and unauthorized access.

2.2.5 All mounting brackets, clamps, nuts, bolts and accessories shall be properly tightened to ensure structural stability.

2.3 Electrical Connections

2.3.1 All internal wiring and electrical connections between solar panel, battery, controller and LED luminaire shall be carried out as per manufacturer's recommendations.

2.3.2 The wiring shall be neatly arranged, properly insulated and protected from mechanical damage and environmental exposure.

2.3.3 All electrical connections shall be checked for continuity, polarity and proper functioning before commissioning.

2.4 Testing and Commissioning

2.4.1 After installation, the complete Solar LED Street Light system shall be tested for proper operation.

2.4.2 The automatic dusk-to-dawn operation shall be checked to ensure switching ON at sunset and switching OFF at sunrise.

2.4.3 The motion sensor shall be tested to verify correct detection range and lighting response.

2.4.4 The remote-control functions shall be tested for proper operation.

2.4.5 The charging and discharging performance of the solar panel and battery system shall be verified.

2.4.6 Any defects observed during testing shall be rectified and the system retested until satisfactory performance is achieved.

2.5 Protection and Completion

2.5.1 All equipment shall be protected from damage during transportation, storage and installation.

2.5.2 The site shall be cleaned after completion of installation and all surplus materials removed.

2.5.3 The complete installation shall be handed over in fully operational condition to the satisfaction of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

3.1 The measurement shall be taken for the number of Solar LED Street Light units supplied, erected, tested and commissioned complete in all respects.

3.2 The rate shall include the cost of:

- Supplying 500W Solar LED Street Light luminaire.
- Solar photovoltaic panel.
- Lithium battery.
- Charge controller and control system.
- Motion sensor and remote control.
- IP65 weatherproof housing.
- Mounting brackets, clamps and accessories.
- Transportation, loading and unloading.
- Erection and installation.
- Electrical wiring and connections.
- Testing and commissioning.
- Labour, tools, equipment and all incidental charges required for satisfactory completion of the work.

3.3 The work shall be executed as per approved drawings, manufacturer's specifications and instructions of the Engineer-in-Charge.

3.4 The rate shall be for a unit of **One Number (Each)**.

Item No.24

Supplying and Erecting Hot Dip Galvanized Octagonal Steel Pole of Approved Make Complete with Junction Box, Foundation and Accessories.

1.0 Materials

1.1 The pole shall be of approved make and manufactured from high quality **Hot Rolled (HR) Steel Sheet** conforming to relevant IS specifications.

1.2 The pole shall be **octagonal in shape**, continuously tapered and fabricated by automatic welding process to achieve uniform strength and appearance.

1.3 The pole shall have the following dimensions:

- Height : **3.0 m**

- Top Diameter : **70 mm**
- Bottom Diameter : **130 mm**
- Thickness : **3 mm**
- Approximate Weight : **29 kg**

1.4 The pole shall be provided with a **200 mm × 200 mm × 12 mm thick base plate** welded at the bottom.

1.5 The pole shall be supplied complete with:

- 4 Nos. M16 foundation bolts
- 450 mm long J-bolts
- Nuts, washers and anchor accessories

1.6 The pole shall be protected by **hot dip galvanization** conforming to **IS 2629, IS 2633 and IS 4759**.

1.7 The pole shall be designed to withstand the local wind speed and loading conditions as specified by relevant standards.

1.8 The pole shall be provided with an integral **junction box** consisting of:

- Minimum 6 mm thick Hylam sheet terminal plate.
- Standard 35 mm × 7.5 mm DIN Rail for mounting MCB.
- Stud type terminal connectors.
- Suitable cable termination arrangement.

2.0 Workmanship

2.1 Fabrication and Galvanization

2.1.1 The octagonal pole shall be fabricated from HR steel sheet by folding and welding to form a uniform tapered section.

2.1.2 The weld seam shall be continuous, smooth and free from visible defects.

2.1.3 After fabrication, the pole shall be hot dip galvanized to provide long-term protection against corrosion.

2.1.4 The galvanized surface shall be smooth, uniform and free from cracks, peeling, bare spots or excessive zinc accumulation.

2.2 Foundation

2.2.1 The foundation shall be constructed as per the manufacturer's approved design and site requirements.

2.2.2 Excavation for foundation shall be carried out to the required dimensions and depth.

2.2.3 The foundation bolts and J-bolts shall be accurately positioned using templates to maintain proper alignment and bolt spacing.

2.2.4 Concrete for the foundation shall be placed, compacted and cured as per relevant specifications.

2.2.5 The foundation shall be capable of safely resisting all dead loads, wind loads and operational loads acting on the pole.

2.3 Erection of Pole

2.3.1 The pole shall be transported, handled and erected carefully without causing damage to the galvanized coating.

2.3.2 The pole shall be erected vertically and fixed securely on the foundation using the specified foundation bolts, nuts and washers.

2.3.3 Proper alignment and plumb shall be ensured before final tightening of foundation bolts.

2.3.4 Any damage to the galvanized surface occurring during transportation or erection shall be repaired using approved zinc-rich coating.

2.4 Junction Box and Electrical Arrangements

2.4.1 The integral junction box shall be installed complete with terminal plate, DIN rail, stud terminals and cable entry arrangements.

2.4.2 All electrical connections shall be neat, secure and suitable for safe operation and maintenance.

2.4.3 The junction box shall provide adequate protection against dust, moisture and mechanical damage.

2.5 Inspection and Completion

2.5.1 The erected pole shall be inspected for alignment, stability, galvanization quality and workmanship.

2.5.2 The contractor shall rectify any defects noticed during inspection at no extra cost.

2.5.3 The completed installation shall be handed over in sound and serviceable condition to the satisfaction of the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

3.1 The measurement shall be taken for the number of octagonal poles supplied and erected complete with foundation, junction box and accessories.

3.2 The rate shall include the cost of:

- Supply of octagonal steel pole.
- Hot dip galvanization.
- Base plate, foundation bolts and J-bolts.
- Integral junction box with terminal plate and DIN rail.
- Excavation and construction of foundation.
- Concrete, curing and allied works.
- Transportation, loading and unloading.

- Erection, alignment and fixing.
- Labour, tools, equipment and all incidental charges required for satisfactory completion of the work.

3.3 The work shall be executed in accordance with relevant IS specifications, manufacturer's recommendations and instructions of the Engineer-in-Charge.

3.4 The rate shall be for a unit of **One Number (Each)**.

Item No.25

Road Marking with Hot Applied Thermoplastic Paint and Reflectorised Glass Beads on Bituminous Surface Complete as per IRC:35-2015.

1.0 Materials

1.1 The thermoplastic road marking material shall be hot applied type and shall conform to the requirements of **IRC:35-2015** and relevant IS specifications.

1.2 The thermoplastic compound shall be suitable for application on bituminous road surfaces and shall be capable of producing durable, weather-resistant and highly reflective markings.

1.3 Reflectorising glass beads shall be of approved quality and shall conform to IRC specifications.

1.4 Glass beads shall be applied at the rate of **250 grams per square meter** of marked area.

1.5 The thermoplastic material shall be white or yellow in colour as specified in the drawings or directed by the Engineer-in-Charge.

1.6 The road marking material shall provide adequate luminance, retro-reflectivity, skid resistance and durability throughout its service life.

2.0 Workmanship

2.1 Surface Preparation

2.1.1 The road surface shall be thoroughly cleaned before application of thermoplastic paint.

2.1.2 All dust, dirt, grease, loose particles, laitance and other foreign matter shall be removed to obtain a clean and dry surface.

2.1.3 The marking layout shall be set out accurately in accordance with approved drawings and traffic management plans.

2.2 Heating and Application

2.2.1 The thermoplastic compound shall be heated in a thermostatically controlled applicator to the temperature recommended by the manufacturer.

2.2.2 The material shall be applied uniformly on the bituminous surface using approved mechanical equipment.

2.2.3 The finished thickness of thermoplastic marking shall be **2.5 mm**, excluding the thickness of surface-applied glass beads.

2.2.4 The finished markings shall be smooth, uniform and free from cracks, streaks, blisters, pinholes, wrinkles and other defects.

2.2.5 The thermoplastic material shall be applied for the following road markings as shown on the drawings or directed by the Engineer-in-Charge:

- Zebra Crossing Markings
- Speed Breaker / Bump Markings
- Lane Markings
- Centre Line Markings
- Edge Line Markings
- Stop Lines
- Directional Markings
- Cut Markings and Other Traffic Control Markings

2.3 Application of Reflectorising Glass Beads

2.3.1 Reflectorising glass beads shall be uniformly sprayed on the hot thermoplastic surface immediately after application.

2.3.2 The application rate shall be **250 g/m²** or as specified in IRC:35-2015.

2.3.3 The beads shall be firmly embedded in the thermoplastic material to ensure long-term retro-reflective performance.

2.4 Performance Requirements

2.4.1 The white colour road markings shall provide minimum luminance coefficient as follows:

- Cement Concrete Road Surface : **130 mcd/m²/lux (minimum)**
- Bituminous (Asphalt) Road Surface : **100 mcd/m²/lux (minimum)**

2.4.2 The road markings shall comply with the requirements of **Section 15 of IRC:35-2015** regarding:

- Daytime Visibility
- Night-Time Retro Reflectivity
- Wet Night Visibility
- Skid Resistance
- Durability and Wear Resistance

2.4.3 The completed markings shall maintain satisfactory visibility and performance under normal traffic and environmental conditions.

2.5 Warranty

2.5.1 The contractor shall provide a minimum **Two (2) Year Warranty** for retro-reflectivity performance of the thermoplastic road markings.

2.5.2 Any failure of retro-reflectivity, peeling, cracking, excessive wear or loss of visibility during the warranty period shall be rectified by the contractor at no additional cost.

3.0 Mode of Measurement and Payment

3.1 The road markings shall be measured in **square meters** of actual marked area completed and accepted.

3.2 Measurement shall be based on the net marked surface area excluding overlaps and wastage.

3.3 The rate shall include the cost of:

- Surface cleaning and preparation.
- Supply of thermoplastic road marking material.
- Heating and application of thermoplastic compound.
- Reflectorising glass beads.
- Layout and setting out of markings.
- Labour, machinery, tools and equipment.
- Traffic control during execution.
- Testing, quality control and warranty obligations.
- All incidental charges required for satisfactory completion of the work.

3.4 The work shall be executed in accordance with **IRC:35-2015**, approved drawings and instructions of the Engineer-in-Charge.

3.5 The rate shall be for a unit of **One Square Meter (Sq. M.)**.

Item No.26

Cat Eye / Road Stud / RPM: Supplying Raised Pavement Markers made of polycarbonate and ABS moulded body and reflective panels with Micro prismatic lens (No Glass bead lens) capable of providing total internal reflection of the light entering the lens face and shall support a load of 13635 kgs. tested in accordance to ASTM D 4280 Type H and complying to Specifications of Category A of MORTH Circular No RW/NH/33023/10-97 & DO III Dt 11.06. 1997. The height, width and length shall not exceed 20 mm, 130 mm and 130 mm and with minimum reflective area of 13 Sqcm on each side and the slope to the base shall be 35 +/- 5 degree. The body of the marker should having finger grip for easy and accurate placement and application with epoxy / bituminous Adhesive as recommended by the manufacturer of the marker. The color of the marker should be as per the IRC 35-2015 and as directed by Engineer-in-charge.

1.0 Materials

1.1 Raised Pavement Markers (RPM) shall be manufactured from high-impact polycarbonate and ABS moulded body and shall conform to the requirements of ASTM D 4280 Type-H and MORTH specifications.

1.2 The reflective panels shall consist of micro-prismatic lenses capable of providing total internal reflection and shall not contain glass bead lenses.

1.3 The dimensions of the marker shall not exceed:

- Height : 20 mm
- Width : 130 mm
- Length : 130 mm

1.4 The minimum reflective area shall be 13 sq.cm on each side of the marker.

1.5 The slope of the marker body to the base shall be $35^{\circ} \pm 5^{\circ}$.

1.6 The marker body shall be provided with finger grip arrangement for easy handling, positioning and installation.

1.7 The adhesive used for fixing shall be epoxy adhesive or bituminous adhesive as recommended by the manufacturer and approved by the Engineer-in-Charge.

1.8 The colour of the markers shall conform to IRC:35-2015 and shall be as specified in the drawings or directed by the Engineer-in-Charge.

2.0 Workmanship

2.1 Surface Preparation

2.1.1 The pavement surface shall be thoroughly cleaned and dried before fixing the markers. All dust, dirt, oil, grease, loose particles and other foreign materials shall be removed.

2.1.2 The location of each marker shall be marked accurately as per approved road marking drawings and instructions of the Engineer-in-Charge.

2.2 Fixing of Road Studs

2.2.1 The adhesive shall be prepared and applied strictly in accordance with the manufacturer's recommendations.

2.2.2 Adequate quantity of adhesive shall be applied on the underside of the marker to ensure complete bonding with the pavement surface.

2.2.3 The marker shall be firmly pressed into position and aligned properly so that the reflective faces are oriented in the correct direction of traffic movement.

2.2.4 Excess adhesive around the marker shall be removed immediately after installation.

2.2.5 The installed markers shall be protected from traffic movement until the adhesive has completely cured.

2.3 Performance Requirements

2.3.1 The marker shall be capable of withstanding a static load of 13,635 kg when tested in accordance with ASTM D 4280 Type-H.

2.3.2 The reflective performance, durability and colour requirements shall comply with IRC:35-2015 and relevant MORTH specifications.

2.3.3 All markers shall be fixed in true alignment, level and position as shown on the drawings or directed by the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

3.1 The work shall be measured by the actual number of Raised Pavement Markers supplied and fixed in position as specified.

3.2 The rate shall include the cost of supplying RPMs, adhesive, transportation, loading, unloading, surface preparation, marking, fixing, alignment, labour, tools and all incidental works required for satisfactory completion of the work.

3.3 No extra payment shall be made for adhesive, alignment, cleaning, curing or protection during installation.

3.4 The rate shall be for a unit of **One Number (Each)**.

Item No.27

Providing and Executing Wall Painting / Artistic Mural Painting / 3D Theme Painting on Approved Wall Surfaces Complete

1.0 Materials

1.1 Water shall conform to M-1.

1.2 Exterior acrylic paint shall be of approved brand, weather-resistant, UV-resistant and suitable for exterior wall applications.

1.3 Primer shall be acrylic exterior primer compatible with the paint system and approved by the Engineer-in-Charge.

1.4 Colours, designs, themes, artistic patterns, murals, graphics, illustrations and 3D visual effects shall be as approved by the Engineer-in-Charge.

1.5 All materials used shall be new, of approved quality and free from defects.

2.0 Workmanship

2.1 Surface Preparation

2.1.1 The wall surface shall be thoroughly cleaned and prepared before commencement of painting work. All loose mortar, dust, dirt, grease, efflorescence, old flaking paint and other foreign matter shall be removed by brushing, scraping, rubbing and sand papering as required.

2.1.2 Cracks, holes and surface imperfections shall be repaired with approved filler material and finished smooth.

2.1.3 The surface shall be allowed to dry completely before application of primer.

2.2 Application of Primer

2.2.1 One coat of approved exterior acrylic primer shall be applied uniformly over the prepared surface.

2.2.2 The primer coat shall be allowed to dry completely before application of paint.

2.3 Artistic Painting / Mural Work

2.3.1 The artwork, mural, theme painting, graphic design or 3D visual effect shall be prepared as per approved drawings, sketches, concepts or instructions of the Engineer-in-Charge.

2.3.2 The design layout shall be accurately marked on the wall surface before commencement of painting.

2.3.3 Painting shall be executed by skilled artists and painters using approved colours and techniques to achieve the desired artistic appearance.

2.3.4 The mural or artwork shall be developed in layers as required to achieve proper colour depth, detailing, shading, highlighting and visual effects.

2.3.5 Where 3D theme painting is specified, suitable perspective techniques, shadow effects, colour gradients and artistic detailing shall be incorporated to create the intended three-dimensional appearance.

2.4 Application of Paint

2.4.1 A minimum of two coats of approved weather-resistant exterior acrylic paint shall be applied over the primed surface.

2.4.2 Each coat shall be applied evenly and smoothly using brushes, rollers or spray equipment as approved.

2.4.3 The subsequent coat shall not be applied until the previous coat has dried completely.

2.4.4 The finished surface shall be uniform in colour, texture and appearance, free from brush marks, streaks, patches, runs, blisters or other defects.

2.5 Protection and Finishing

2.5.1 Completed artwork shall be protected from dust, rain, damage and vandalism during execution and until final acceptance.

2.5.2 Any defective, damaged or unsatisfactory portion shall be rectified by the contractor at no extra cost.

2.5.3 The completed mural or painting shall match the approved design, colour scheme and artistic concept.

3.0 Mode of Measurement and Payment

3.1 The work shall be measured in square meters of actual wall surface painted and completed as specified.

3.2 Measurement shall include artistic mural painting, theme painting, 3D visual artwork, lettering, graphics, decorative patterns and all associated painting work executed on the approved surface.

3.3 The rate shall include surface preparation, cleaning, scraping, sand papering, repairs to minor surface defects, primer coat, paints, artistic design development, sketching, layout marking, mural execution, 3D effects, labour, scaffolding, tools, equipment, protection and all incidental works necessary for satisfactory completion of the work.

3.4 No extra payment shall be made for multiple colours, artistic detailing, shading effects, lettering, logos, decorative elements or design complexity.

3.5 The rate shall be for a unit of **One Square Meter (Sq. M.)**.

Item No.28

20mm thick sand faced cement plaster on walls upto height 10 metres above ground level consisting of 12mm thick backing coat of C.M. 1:3 (1-cement : 3-sand) and 8mm thick finishing coat of C.M. 1:1 (1-cement : 1-sand) etc. complete

1.0 Materials

1.1 Water shall conform to M-1.

1.2 Cement shall conform to M-3.

1.3 Sand shall conform to M-6.

1.4 Cement mortar shall conform to M-11.

2.0 Workmanship

2.1 Surface Preparation

2.1.1 The surface to be plastered shall be cleaned of all dust, dirt, loose mortar, efflorescence, oil, grease and other foreign matter.

2.1.2 All joints in masonry shall be raked out properly and the surface shall be wetted thoroughly before application of plaster.

2.1.3 The surface shall be brought to true line, level and plumb before commencement of plastering work.

2.2 Backing Coat

2.2.1 The backing coat shall be 12 mm thick in Cement Mortar 1:3 (1 Cement : 3 Sand).

2.2.2 The mortar shall be applied evenly over the prepared surface and finished to a uniform thickness.

2.2.3 Before the first coat hardens, its surface shall be roughened by beating with wooden floats and making close indentations to provide a proper mechanical key for the finishing coat.

2.2.4 The backing coat shall be allowed to set for a period of 3 to 5 days depending upon weather conditions before application of the finishing coat.

2.2.5 The backing coat shall be kept continuously moist during the setting period and shall not be allowed to dry.

2.3 Finishing Coat

2.3.1 The finishing coat shall be 8 mm thick in Cement Mortar 1:1 (1 Cement : 1 Sand).

2.3.2 The mortar shall be applied uniformly over the backing coat and finished to obtain an approved sand faced texture.

2.3.3 The sand faced finish shall be produced by brushing the surface while the mortar is still green so that the sand particles are uniformly exposed.

2.3.4 A sample panel shall be prepared and approved by the Engineer-in-Charge before commencement of the work.

2.3.5 The completed plaster shall be true to line and level and free from waviness, cracks, blisters, patches or other defects.

2.4 Curing

2.4.1 Curing shall commence within 24 hours after completion of plastering.

2.4.2 The plastered surface shall be kept continuously wet for a period of not less than 7 days.

2.4.3 The plastered surface shall be protected from damage, excessive drying and adverse weather conditions during the curing period.

3.0 Mode of Measurement and Payment

3.1 The work shall be measured in square meters of actual plastered surface completed as specified.

3.2 No deduction shall be made for openings up to the limits specified in the relevant standard specifications.

3.3 The rate shall include the cost of all materials, labour, scaffolding, preparation of surface, mixing, application of both coats, sand faced finishing, curing, tools, equipment and all incidental charges necessary for satisfactory completion of the work.

3.4 The rate shall be for a unit of One Square Meter (Sq. M.).

Item No.29

Providing and laying controlled cement concrete M.250 and curing complete excluding the cost of formwork and reinforcement for reinforced concrete work in (A) Foundations, footings, Base of columns and Mass concrete.

1.0 Materials

1.1 Water shall conform to M-1.

1.2 Cement shall conform to M-3.

1.3 Fine aggregate (sand) shall conform to M-6.

1.4 Coarse aggregate shall conform to M-12 and shall be clean, hard, durable and graded as per relevant IS specifications.

1.5 Controlled cement concrete shall conform to M-250 grade with a characteristic compressive strength of 25 MPa at 28 days.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of providing, mixing, transporting, placing, compacting, finishing and curing controlled cement concrete of M-250 grade in foundations, footings, base of columns and mass concrete as shown on drawings or as directed by the Engineer-in-Charge.

2.1.2 Before placing concrete, the foundation bed shall be cleaned of all loose materials, water, mud and foreign matter and shall be properly prepared and approved by the Engineer-in-Charge.

2.2 Proportioning and Mixing

2.2.1 Concrete shall be design mix concrete of M-250 grade and shall be produced in accordance with approved mix design.

2.2.2 The batching of materials shall be done by weight to ensure accuracy and consistency of the mix.

2.2.3 Concrete shall be mixed in a mechanical mixer or batching plant until a uniform mix of required consistency is obtained.

2.2.4 The quantity of water shall be carefully controlled to achieve the specified workability and strength requirements.

2.3 Transportation and Placing

2.3.1 Concrete shall be transported from the place of mixing to the place of final deposition as rapidly as practicable without segregation or loss of materials.

2.3.2 Concrete shall be deposited as nearly as possible in its final position to avoid rehandling.

2.3.3 Concrete shall be placed in layers of suitable thickness and shall be completed before the initial setting of cement commences.

2.3.4 Dropping of concrete from excessive heights causing segregation shall not be permitted.

2.4 Compaction

2.4.1 Concrete shall be thoroughly compacted immediately after placing by means of approved mechanical vibrators.

2.4.2 Particular care shall be taken to ensure complete compaction around corners, edges and confined sections.

2.4.3 Compaction shall continue until all air voids are removed and a dense concrete mass is obtained.

2.5 Finishing

2.5.1 The exposed surfaces shall be finished true to line, level and slope as shown on the drawings or as directed.

2.5.2 All laitance and defective concrete shall be removed and made good immediately.

2.6 Curing

2.6.1 Concrete shall be protected from premature drying and adverse weather conditions immediately after placement.

2.6.2 Curing shall commence as soon as the concrete has hardened sufficiently and shall continue for a minimum period of 14 days.

2.6.3 The concrete surface shall be kept continuously moist by ponding, wet coverings or other approved methods.

2.7 Quality Control

2.7.1 Concrete shall be tested in accordance with relevant IS specifications to verify compliance with the specified grade.

2.7.2 Sampling, cube casting and testing shall be carried out as directed by the Engineer-in-Charge.

2.7.3 Any concrete not meeting the specified requirements shall be removed and replaced by the contractor at his own cost.

3.0 Mode of Measurement and Payment

3.1 Concrete shall be measured in cubic meters for the actual dimensions shown on the drawings or as directed by the Engineer-in-Charge.

3.2 No deduction shall be made for reinforcement, inserts, pipes or embedded fixtures occupying minor volumes as per standard specifications.

3.3 The rate shall include the cost of all materials, batching, mixing, transporting, placing, compacting, finishing, curing, testing, labour, tools, machinery and all incidental charges necessary for satisfactory completion of the work.

3.4 The rate excludes the cost of reinforcement steel and formwork, which shall be measured and paid separately.

3.5 The rate shall be for a unit of One Cubic Meter (Cum).

Item No.30

Providing TMT Bar FE 500D reinforcement for R.C.C. work including bending, binding and placing in position complete upto floor two level

1.0 Materials

1.1 Reinforcement steel shall consist of Thermo Mechanically Treated (TMT) bars of Grade Fe 500D conforming to the latest relevant Indian Standards.

1.2 Binding wire shall be annealed mild steel wire of approved quality conforming to relevant Indian Standards.

1.3 All reinforcement steel shall be free from loose rust, oil, grease, paint, mud, scales and other foreign matter that may impair bond with concrete.

2.0 Workmanship

2.1 General

2.1.1 The reinforcement shall be accurately cut, bent, fabricated and fixed in accordance with the approved structural drawings, bar bending schedules and directions of the Engineer-in-Charge.

2.1.2 All reinforcement shall be placed in correct position and securely tied to prevent displacement during concreting operations.

2.1.3 Reinforcement bars shall be stored above ground level on suitable supports and protected from excessive corrosion and contamination.

2.2 Cutting and Bending

2.2.1 Bars shall be cut and bent cold according to approved bar bending schedules and standard codes of practice.

2.2.2 Bending shall be carried out by approved mechanical or manual methods without causing damage to the reinforcement.

2.2.3 Re-bending of bars shall not be permitted except with the approval of the Engineer-in-Charge.

2.2.4 The dimensions and shapes of bent bars shall strictly conform to the approved drawings and schedules.

2.3 Placing of Reinforcement

2.3.1 Reinforcement shall be placed accurately in position as shown on the drawings and maintained in the correct alignment during concreting.

2.3.2 Suitable concrete cover blocks of approved quality and dimensions shall be provided to maintain the specified clear cover to reinforcement.

2.3.3 Chairs, spacers, hangers and supporting bars required for maintaining reinforcement in position shall be provided as necessary.

2.3.4 The reinforcement shall be rigidly secured by binding wire at all intersections and laps to prevent displacement.

2.4 Lapping and Joints

2.4.1 Laps in reinforcement bars shall be provided only at locations shown on drawings or approved by the Engineer-in-Charge.

2.4.2 Lap lengths shall conform to structural drawings and relevant Indian Standard specifications.

2.4.3 Welding of reinforcement bars shall not be carried out unless specifically permitted in the design and approved by the Engineer-in-Charge.

2.5 Inspection

2.5.1 All reinforcement shall be inspected and approved by the Engineer-in-Charge before commencement of concreting.

2.5.2 No concrete shall be placed until the reinforcement arrangement, cover, spacing, laps and supports have been checked and approved.

2.6 Tolerances

2.6.1 The spacing, cover and position of reinforcement shall be maintained within permissible tolerances specified in the relevant Indian Standards.

2.6.2 Any reinforcement found displaced or incorrectly fixed shall be rectified by the contractor at his own cost before concreting.

3.0 Mode of Measurement and Payment

3.1 Reinforcement shall be measured by weight in kilograms based on the actual quantity of steel fixed in position as per approved drawings and bar bending schedules.

3.2 The weight shall be calculated from the standard unit weight of reinforcement bars corresponding to their nominal diameters unless otherwise directed.

3.3 No allowance shall be made for wastage, rolling margin, clips, chairs, spacer bars or unauthorized laps.

3.4 The rate shall include supplying, cutting, straightening, bending, binding with annealed binding wire, placing in position, supporting, lapping, handling, transportation and all labour, tools, plants and incidental charges required for completion of the work.

3.5 The rate shall be for a unit of One Kilogram (Kg.).

Item No.31

Providing, supplying, installing, testing and commissioning Square Outdoor Full Colour LED Display Screen of approved size and resolution, suitable for outdoor applications, having minimum IP-65 protection rating, high brightness LED modules, aluminium/metal cabinet, complete with control system, power supply units, data cables, mounting structure, brackets, connectors, necessary hardware, software configuration, electrical connections, testing and commissioning, including all labour, transportation and accessories required for satisfactory operation, complete in all respects as directed by the Engineer-in-Charge.

1.0 Materials

1.1 The LED Display Screen shall be a factory manufactured Outdoor Full Colour LED Display of approved make, size, resolution and configuration suitable for continuous outdoor operation.

1.2 The LED modules shall be of high brightness, energy efficient type capable of providing clear visibility during daytime and nighttime conditions.

1.3 The display cabinet shall be fabricated from aluminium or corrosion-resistant metal and shall be robust enough to withstand outdoor environmental conditions.

1.4 The complete display system shall have a minimum protection rating of IP-65 for outdoor use.

1.5 The system shall include LED modules, receiving cards, sending cards, control system, power supply units, data cables, power cables, connectors, software, mounting brackets and all accessories required for proper functioning.

1.6 All electrical components, cables and accessories shall conform to the relevant Indian Standards and manufacturer's specifications.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of supplying, transporting, handling, installing, testing and commissioning the Outdoor Full Colour LED Display Screen complete in accordance with approved drawings, manufacturer's recommendations and directions of the Engineer-in-Charge.

2.1.2 All materials shall be new, free from defects and of approved quality.

2.1.3 The contractor shall submit technical specifications, catalogues and manufacturer's details for approval before commencement of work.

2.2 Mounting Structure

2.2.1 The display screen shall be securely fixed on a suitable supporting structure designed to withstand dead load, wind load and other service loads.

2.2.2 The mounting structure, brackets, clamps, fasteners and supporting members shall be properly aligned, leveled and securely fixed.

2.2.3 All exposed steel components shall be properly treated against corrosion by galvanizing or approved protective coating.

2.3 Installation of LED Display

2.3.1 LED modules shall be installed in a neat and uniform manner ensuring proper alignment and seamless appearance of the display surface.

2.3.2 All electrical and data connections shall be carried out strictly as per the manufacturer's instructions.

2.3.3 Necessary power supply units, controllers, receiving cards and communication devices shall be installed and connected for reliable operation.

2.3.4 All cables shall be properly routed, supported, protected and terminated using approved connectors and accessories.

2.4 Software Configuration

2.4.1 The control software shall be installed and configured for proper operation of the display system.

2.4.2 The display shall be capable of showing text, graphics, images, videos and other multimedia content as specified.

2.4.3 Necessary programming, addressing and calibration of LED modules shall be carried out to ensure uniform brightness and colour reproduction.

2.5 Testing and Commissioning

2.5.1 After installation, the complete system shall be tested for proper functioning, brightness, colour uniformity, communication, display quality and electrical safety.

2.5.2 Any defects observed during testing shall be rectified by the contractor at no extra cost.

2.5.3 The system shall be commissioned only after successful testing and approval of the Engineer-in-Charge.

2.6 Protection and Safety

2.6.1 The contractor shall take all necessary precautions to protect the display screen and associated equipment from damage during transportation, installation and commissioning.

2.6.2 All electrical installations shall comply with applicable safety regulations and standards.

2.6.3 Suitable earthing and surge protection arrangements shall be provided for safe and reliable operation.

3.0 Mode of Measurement and Payment

3.1 The Outdoor Full Colour LED Display Screen shall be measured as a complete installed and commissioned unit of approved size and specification.

3.2 The rate shall include the cost of supply, transportation, loading, unloading, handling, mounting structure, brackets, fixing accessories, LED modules, control system, power supplies, software configuration, cabling, electrical connections, testing, commissioning, labour, tools, equipment and all incidental charges required for satisfactory completion of the work.

3.3 No separate payment shall be made for mounting brackets, connectors, control units, software installation, calibration, testing or commissioning.

3.4 The work shall be considered complete only after successful testing, commissioning and approval by the Engineer-in-Charge.

3.5 The rate shall be for a unit of One Number (No.).

Item No.32

Providing loam or Clay Soil of approved quantity on site.

1.0 Materials

1.1 The loam or clay soil shall be of approved quality, free from stones, gravel, roots, vegetation, organic matter, rubbish and other deleterious materials.

1.2 The soil shall be obtained from approved borrow areas, quarries or sources as approved by the Engineer-in-Charge.

1.3 The soil shall possess suitable physical characteristics required for landscaping, filling, gardening or other specified purposes.

1.4 The material shall be capable of being spread, compacted or dressed to the required levels and profiles without segregation.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of supplying, transporting, loading, unloading and stacking approved loam or clay soil at the specified location as directed by the Engineer-in-Charge.

2.1.2 The soil shall be brought from approved sources and delivered in sound condition without contamination.

2.1.3 Any unsuitable or rejected material shall be removed from the site at the contractor's own cost.

2.2 Transportation and Stacking

2.2.1 The soil shall be transported by suitable means and deposited at the designated locations without causing inconvenience or damage to existing works.

2.2.2 The soil shall be stacked neatly in approved heaps or spread as directed by the Engineer-in-Charge.

2.2.3 Care shall be taken to avoid mixing of approved soil with unsuitable materials during transportation and handling.

2.3 Spreading and Dressing (When Required)

2.3.1 Where specified, the soil shall be spread uniformly to the required thickness and dressed to the required lines, levels and slopes.

2.3.2 The surface shall be finished smooth and free from undulations, depressions and foreign materials.

2.3.3 Light watering and consolidation shall be carried out where directed by the Engineer-in-Charge.

3.0 Mode of Measurement and Payment

3.1 The quantity of loam or clay soil shall be measured in cubic meters based on the actual volume supplied and placed at site.

3.2 Measurement shall be taken for the completed work as approved by the Engineer-in-Charge.

3.3 The rate shall include the cost of procuring, royalty (if applicable), loading, transportation, unloading, stacking, spreading, dressing, labour, tools, equipment and all incidental charges necessary for satisfactory completion of the work.

3.4 No separate payment shall be made for handling, wastage, temporary storage or re-handling of the material.

3.5 The rate shall be for a unit of One Cubic Meter (Cum.).

Item No.33

Providing and stacking of Fishtail palm of ht. 210-240 cm bottom girth 25-30 cm well developed in big size HDPE bags as per direction of the officer-in-charge.

1.0 Materials

1.1 The Fishtail Palm (*Caryota mitis* or approved equivalent species) shall be healthy, vigorous, well-grown and free from diseases, pests, injuries and defects.

1.2 The palm shall have a height ranging from 210 cm to 240 cm and a bottom girth ranging from 25 cm to 30 cm unless otherwise specified.

1.3 The plant shall possess a well-developed root system and shall be supplied in sound, adequately sized HDPE bags to ensure safe transportation and handling.

1.4 The HDPE bags shall be of sufficient strength and size to retain the root ball intact and prevent damage during transportation and stacking.

1.5 All plants shall be obtained from approved nurseries and shall conform to the quality requirements approved by the Engineer-in-Charge.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of supplying, loading, transporting, unloading and stacking Fishtail Palm plants of the specified size and quality at the designated location as directed by the Engineer-in-Charge.

2.1.2 The plants shall be carefully handled during lifting, transportation and unloading to avoid damage to stems, leaves, roots and growing shoots.

2.1.3 Any plant found damaged, unhealthy, diseased or not conforming to the specified requirements shall be rejected and replaced by the contractor at his own cost.

2.2 Transportation

2.2.1 The plants shall be transported in a manner that prevents injury, drying of roots or breakage of foliage.

2.2.2 Adequate protection shall be provided during transportation against wind, excessive sunlight and mechanical damage.

2.2.3 The contractor shall take all precautions to maintain the plants in healthy condition until acceptance by the Engineer-in-Charge.

2.3 Stacking

2.3.1 The palms shall be stacked neatly at locations shown on the drawings or as directed by the Engineer-in-Charge.

2.3.2 The plants shall be arranged in an upright position with adequate spacing to prevent overcrowding and damage.

2.3.3 The stacked plants shall be regularly watered and maintained in healthy condition until they are taken over or planted.

2.3.4 The contractor shall protect the plants from damage due to weather, animals, vandalism or other causes during the stacking period.

2.4 Inspection

2.4.1 All plants shall be subject to inspection and approval by the Engineer-in-Charge.

2.4.2 Only approved plants conforming to the specified height, girth and quality requirements shall be accepted for measurement and payment.

3.0 Mode of Measurement and Payment

3.1 The Fishtail Palm shall be measured on the basis of the actual number of approved plants supplied and stacked at site.

3.2 Only healthy and approved plants of the specified size and quality shall be considered for payment.

3.3 The rate shall include the cost of plants, HDPE bags, procurement, loading, transportation, unloading, stacking, watering, protection, maintenance during stacking period, labour, tools, equipment and all incidental charges required for satisfactory completion of the work.

3.4 No separate payment shall be made for replacement of damaged or rejected plants.

3.5 The rate shall be for a unit of One Number (No.).

Item No.34

Providing and Displaying Bamboo Buddha Valley with fresh & healthy 5 to 6 suckers 1.80 m to 2.10m ht umbrella type well developed in 50 cm Cement Pot as per direction of the officer-in-charge.

1.0 Materials

1.1 The Bamboo Buddha Valley shall be of approved species, healthy, vigorous, well-grown and free from diseases, pests, injuries and other defects.

1.2 Each plant shall have 5 to 6 healthy suckers and shall be of umbrella type growth with a height ranging from 1.80 m to 2.10 m.

1.3 The bamboo plant shall have a well-developed root system and shall be properly established in a cement pot of 50 cm diameter or approved equivalent size.

1.4 The cement pot shall be sound, free from cracks, uniform in finish and of approved design, shape and colour as directed by the Engineer-in-Charge.

1.5 The growing media shall consist of good quality soil, sand, manure and other approved materials necessary for healthy plant growth.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of supplying, transporting, handling, placing and displaying Bamboo Buddha Valley plants of the specified size and quality complete in cement pots at locations shown on drawings or as directed by the Engineer-in-Charge.

2.1.2 All plants shall be obtained from approved nurseries and shall conform to the specified requirements.

2.1.3 The plants shall be maintained in fresh, healthy and attractive condition until inspection and acceptance by the Engineer-in-Charge.

2.2 Preparation and Potting

2.2.1 The bamboo plants shall be properly planted and established in 50 cm cement pots with suitable growing media.

2.2.2 The soil mixture shall provide adequate drainage, aeration and nutrient content for healthy growth of the plants.

2.2.3 The root system shall be fully covered and firmly established within the pot without causing damage to the roots.

2.3 Transportation and Handling

2.3.1 The plants and pots shall be transported carefully to prevent damage to stems, foliage, roots and containers.

2.3.2 Special care shall be taken during loading, unloading and handling to avoid breakage of pots and injury to plants.

2.3.3 Any damaged, diseased or defective plant or pot shall be replaced by the contractor at his own cost.

2.4 Displaying

2.4.1 The potted bamboo plants shall be placed and displayed neatly at the designated locations as directed by the Engineer-in-Charge.

2.4.2 The plants shall be properly aligned and positioned to achieve the desired aesthetic appearance.

2.4.3 The displayed plants shall be watered and maintained regularly to ensure healthy growth and appearance.

2.4.4 The contractor shall protect the plants from damage due to weather, animals, vandalism or any other cause until completion of the work.

2.5 Inspection

2.5.1 All plants and pots shall be subject to inspection and approval by the Engineer-in-Charge.

2.5.2 Only healthy plants conforming to the specified height, number of suckers and quality requirements shall be accepted.

3.0 Mode of Measurement and Payment

3.1 The Bamboo Buddha Valley plants shall be measured on the basis of the actual number of approved units supplied and displayed at site.

3.2 Each unit shall consist of a healthy bamboo plant with 5 to 6 suckers, established in a 50 cm cement pot and displayed in position as specified.

3.3 The rate shall include the cost of bamboo plants, cement pots, soil mixture, manure, loading, transportation, unloading, handling, placing, displaying, watering, maintenance, labour, tools, equipment and all incidental charges required for satisfactory completion of the work.

3.4 No separate payment shall be made for replacement of damaged or rejected plants or pots.

3.5 The rate shall be for a unit of One Number (No.).

Item No.35

Providing and Displaying Asiatic lilly hybrid variety (3 in one) plants in each pot having in full bloom 3 to 5 flowers 30 to 45 cm ht. well developed in 25 cm Earthen Pot/Plastic Pot and as per direction of the officer-in-charge

1.0 Materials

1.1 The Asiatic Lily plants shall be of approved hybrid variety, healthy, vigorous, well-grown and free from diseases, pests, insects and mechanical damage.

1.2 Each pot shall contain three healthy Asiatic Lily plants (3 in One) having a height ranging from 30 cm to 45 cm and bearing 3 to 5 fully bloomed flowers at the time of supply.

1.3 The plants shall possess healthy foliage, strong stems and well-developed root systems suitable for ornamental display purposes.

1.4 The plants shall be supplied in approved quality earthen pots or plastic pots of 25 cm diameter and adequate depth.

1.5 The pots shall be sound, neat in appearance, free from cracks, deformities and other defects.

1.6 The potting mixture shall consist of fertile soil, sand, compost, organic manure and other approved materials necessary for healthy growth and flowering.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of supplying, transporting, handling, placing and displaying Asiatic Lily Hybrid Variety plants in approved pots at locations shown on drawings or as directed by the Engineer-in-Charge.

2.1.2 All plants shall be obtained from approved nurseries and shall conform to the specified size, flowering condition and quality requirements.

2.1.3 Only fresh, healthy and fully bloomed plants shall be accepted for display.

2.2 Preparation and Potting

2.2.1 The plants shall be properly established in 25 cm earthen pots or plastic pots using approved potting media.

2.2.2 The soil mixture shall provide adequate drainage, moisture retention and nutrient content for healthy growth and flowering.

2.2.3 The plants shall be firmly rooted and adequately supported within the pots.

2.3 Transportation and Handling

2.3.1 The plants shall be transported carefully to prevent damage to flowers, stems, foliage, roots and pots.

2.3.2 Special care shall be taken during loading, unloading and handling to maintain the blooming condition and appearance of the plants.

2.3.3 Any damaged, wilted, diseased or defective plants shall be removed and replaced by the contractor at his own cost.

2.4 Displaying

2.4.1 The potted plants shall be displayed neatly and uniformly at designated locations as directed by the Engineer-in-Charge.

2.4.2 The arrangement shall provide an attractive and aesthetically pleasing appearance.

2.4.3 The plants shall be watered and maintained regularly to preserve their freshness and flowering condition during the display period.

2.4.4 The contractor shall protect the plants from adverse weather conditions, vandalism, animals and other causes of damage.

2.5 Inspection

2.5.1 All plants shall be subject to inspection and approval by the Engineer-in-Charge.

2.5.2 Only plants conforming to the specified height, flowering condition, number of flowers and overall quality shall be accepted for payment.

3.0 Mode of Measurement and Payment

3.1 The Asiatic Lily Hybrid Variety plants shall be measured on the basis of the actual number of approved potted plants supplied and displayed at site.

3.2 Each unit shall consist of three Asiatic Lily plants established in one 25 cm earthen pot or plastic pot and displayed in position as specified.

3.3 The rate shall include the cost of plants, pots, potting mixture, manure, loading, transportation, unloading, handling, displaying, watering, maintenance, replacement of damaged plants, labour, tools, equipment and all incidental charges required for satisfactory completion of the work.

3.4 No separate payment shall be made for maintenance, replacement of rejected plants or protection during the display period.

3.5 The rate shall be for a unit of One Number (No.).

Item No.36

Providing and stacking of Foxtail palm of ht. 180-210 cm bottom girth 25- 30 cm well developed in big size HDPE bags as per direction of the officer-in-charge

1.0 Materials

1.1 The Foxtail Palm plants shall be of approved healthy variety, well-grown, vigorous, disease-free, pest-free and free from mechanical damage.

1.2 The plants shall conform to the specified height of 180–210 cm with a well-developed straight trunk and uniform canopy growth.

1.3 The bottom girth of the plant shall be 25–30 cm, properly hardened and suitable for field plantation.

1.4 The plants shall be well-rooted and maintained in big-size HDPE bags with proper drainage and root development.

1.5 The plants shall be supplied in good condition without any dryness, yellowing, decay or root-bound defects.

1.6 Only approved nursery stock shall be accepted, and all plants shall be subject to inspection by the Officer-in-Charge before acceptance.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of supplying, transporting, handling, loading, unloading and stacking of Foxtail Palm plants at designated site locations as directed by the Engineer-in-Charge.

2.1.2 All plants shall be procured from approved nurseries and shall strictly conform to the specified size, girth and quality requirements.

2.1.3 Only healthy, well-established and uniform plants shall be accepted for stacking at site.

2.2 Handling and Transportation

2.2.1 The plants shall be handled carefully during lifting, loading, unloading and transportation to avoid damage to stems, leaves and root balls.

2.2.2 The HDPE bags shall be kept intact during handling and transportation to prevent root disturbance.

2.2.3 Any damaged, diseased, dried or defective plants shall be rejected and replaced by the contractor at his own cost.

2.3 Stacking at Site

2.3.1 The plants shall be properly stacked at designated locations in an orderly manner as directed by the Engineer-in-Charge.

2.3.2 Adequate spacing shall be maintained between plants for proper ventilation, inspection and easy handling.

2.3.3 The stacked plants shall be protected from adverse weather conditions, animals, vandalism and other damages.

2.3.4 The contractor shall maintain the plants in good condition during the stacking period till final acceptance.

2.4 Inspection

2.4.1 All plants shall be subject to inspection and approval by the Engineer-in-Charge.

2.4.2 Only plants conforming to the specified height, girth, health and overall quality shall be accepted for measurement and payment.

3.0 Mode of Measurement and Payment

3.1 The Foxtail Palm plants shall be measured on the basis of the actual number of approved plants supplied and stacked at site.

3.2 Each unit shall consist of one Foxtail Palm plant of specified height (180–210 cm) and bottom girth (25–30 cm) in HDPE bag, properly stacked at designated location.

3.3 The rate shall include the cost of plants, procurement, nursery charges, loading, transportation, unloading, handling, stacking, labour, tools, equipment and all incidental charges required for satisfactory completion of the work.

3.4 No extra payment shall be made for replacement of rejected plants, protection, or maintenance during stacking.

3.5 The rate shall be for a unit of One Number (No.).

Item No.37

Excavation in any soil upto 30 cm. depth, bracking clods, removing unwanted stuff such as brick bats, stones, grass, roots etc. refilling the same, preplanting , watering, weeding. Top-digging, relevening and bringing the earth to fine tilth, ready for sowing or planting.

1.0 Materials / Requirements

1.1 The soil shall be of suitable quality for horticultural use and shall be free from rubbish, harmful weeds, stones, brick bats, and other foreign materials.

1.2 Organic or inorganic matter, if required for improvement of soil structure, shall be as approved by the Officer-in-Charge.

1.3 Water required for soil preparation, watering and consolidation shall be clean and free from harmful substances.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of excavation, loosening, cleaning, preparation and dressing of soil to make it suitable for plantation or sowing as directed at site.

2.1.2 The soil shall be thoroughly worked to ensure proper aeration, drainage and fertility conditions for plant growth.

2.2 Excavation and Cleaning

2.2.1 Excavation shall be carried out in all types of soil up to 30 cm depth.

2.2.2 All clods shall be broken properly to obtain a uniform loose soil structure.

2.2.3 All unwanted materials such as brick bats, stones, grass, roots, weeds and other foreign matter shall be removed completely from the site.

2.3 Soil Preparation

2.3.1 The excavated soil shall be refilled after proper cleaning and loosening.

2.3.2 The soil shall be top dug and thoroughly mixed to achieve uniform texture and fertility.

2.3.3 Watering shall be done as required to settle the soil and improve moisture conditions.

2.3.4 Weeding shall be carried out to ensure complete removal of unwanted vegetation before planting.

2.3.5 The soil surface shall be properly levelled and dressed to a fine tilth, suitable for sowing or plantation.

2.4 Final Preparation

2.4.1 The prepared soil shall be left in a friable, well-aerated and clean condition, ready for plantation or sowing.

2.4.2 The entire operation shall be carried out as per the instructions of the Officer-in-Charge.

3.0 Mode of Measurement and Payment

3.1 The work shall be measured in square metres (m²) of area actually prepared and approved.

3.2 The rate shall include excavation up to 30 cm depth, breaking of clods, removal of debris, refilling, watering, weeding, top digging, re-levelling and preparation of fine tilth.

3.3 The rate shall also include all labour, tools, equipment, transport, watering, and incidental charges required for complete execution of the work.

3.4 No extra payment shall be made for minor undulations, re-dressing, or maintenance of soil condition until approval.

3.5 The rate shall be for a unit of One Square Metre (m²).

Item No.38

Providing, supplying and fixing Free Seating Benches of approved design, size and material, fabricated from RCC, steel or a combination thereof, complete with all necessary supports, foundations, fixtures, surface finishing, painting/coating and installation. The free seating arrangement shall be durable, weather-resistant and suitable for public spaces, parks, walkways and landscape areas. The design, dimensions, colour scheme and finishing shall be as approved by the Engineer-in-Charge, complete in all respects including transportation, erection and fixing at site.

1.0 Materials

1.1 The Free Seating Benches shall be fabricated from approved materials such as RCC, structural steel, cast iron, hardwood/treated wood, or combination thereof, as specified and approved by the Engineer-in-Charge.

1.2 All steel components shall be of standard structural quality, free from defects, rust, and shall be properly treated with anti-corrosive primer and finishing coats.

1.3 RCC components shall be of approved grade concrete, properly cured, finished smooth, and free from honeycombing or surface defects.

1.4 Wooden components, if used, shall be well-seasoned, termite-resistant, and treated with suitable preservatives.

1.5 All fasteners, anchors, bolts, nuts, and fixtures shall be of corrosion-resistant material suitable for outdoor exposure.

2.0 Workmanship

2.1 General

2.1.1 The work shall include fabrication, transportation, handling, assembly, and installation of Free Seating Benches at locations as directed by the Engineer-in-Charge.

2.1.2 The benches shall be manufactured strictly as per approved drawings, design specifications, and samples approved prior to execution.

2.1.3 The finished benches shall be robust, stable, safe for public use, and aesthetically suitable for landscape environments.

2.2 Fabrication and Finishing

2.2.1 All components shall be fabricated with precision to ensure proper alignment, structural stability, and smooth finishing.

2.2.2 Steel members shall be properly welded, ground smooth, and coated with anti-corrosive primer followed by approved finish paint/powder coating.

2.2.3 RCC surfaces shall be properly moulded, finished, cured, and treated with approved surface finish as specified.

2.2.4 Wooden elements, if any, shall be polished, sealed, and treated to withstand weather exposure and prevent decay.

2.3 Installation and Fixing

2.3.1 The benches shall be installed at designated locations as per layout and direction of the Engineer-in-Charge.

2.3.2 Proper foundations/anchoring shall be provided to ensure firm fixing and stability against movement, vandalism, or wind load.

2.3.3 The installation shall be levelled, aligned, and finished neatly with surrounding surfaces such as paving, grass, or hardscape.

2.3.4 Any damage occurring during transportation or installation shall be rectified or replaced by the contractor at his own cost.

2.4 Inspection

2.4.1 All benches shall be subject to inspection and approval by the Engineer-in-Charge prior to final acceptance.

2.4.2 Only benches conforming to approved design, material quality, finishing, and stability shall be accepted for payment.

3.0 Mode of Measurement and Payment

3.1 The Free Seating Benches shall be measured in numbers (each complete bench installed in position).

3.2 The rate shall include cost of materials, fabrication, transportation, loading, unloading, fixing, foundations, anchoring, finishing, painting/coating, and all labour, tools, equipment, and incidental charges.

3.3 No extra payment shall be made for minor adjustments, alignment, protection, or maintenance during installation.

3.4 The rate shall be for a unit of One Number (No.) of Free Seating Bench complete in all respects.

Item No.39

Providing, supplying and fixing illuminated advertising kiosks of approved design and dimensions, comprising a sturdy MS/metal frame structure with acrylic/polycarbonate display panels and energy-efficient LED backlighting system for uniform illumination. The kiosk shall be suitable for displaying posters, flex prints, public information and advertisements, with provision for easy replacement of display media. The unit shall be weather-resistant and complete with all necessary hardware, electrical fittings, wiring, mounting arrangements, painting and finishing, including transportation, installation, testing and commissioning, either as standalone or polemounted as per site requirements, complete in all respects as directed by the Engineer-in-Charge.

1.0 Materials

1.1 The kiosk structure shall be fabricated from high-quality mild steel (MS) sections or approved metal framework, free from defects, properly welded and structurally sound.

1.2 Display panels shall be made of acrylic or polycarbonate sheets of approved thickness, UV-resistant, impact-resistant, and suitable for outdoor exposure.

1.3 The illumination system shall consist of energy-efficient LED modules/strips with uniform light distribution and long service life.

1.4 All electrical components including wiring, drivers, connectors, switches, and accessories shall conform to relevant IS standards and shall be suitable for outdoor usage.

1.5 All fasteners, hinges, locks, and fixing accessories shall be corrosion-resistant and suitable for long-term outdoor performance.

2.0 Workmanship

2.1 General

2.1.1 The work shall include fabrication, supply, transportation, erection, installation, testing and commissioning of illuminated kiosks at locations specified by the Engineer-in-Charge.

2.1.2 The kiosk shall be fabricated strictly as per approved shop drawings, design specifications and samples.

2.1.3 The finished unit shall be aesthetically pleasing, structurally stable, safe for public use and suitable for urban landscape integration.

2.2 Fabrication and Finishing

2.2.1 The MS frame shall be properly fabricated, welded, ground smooth and finished free from sharp edges and defects.

2.2.2 The structure shall be treated with anti-corrosive primer and finished with approved powder coating or paint of suitable shade and durability.

2.2.3 Acrylic/polycarbonate panels shall be properly cut, fixed and sealed to ensure dustproof and waterproof performance.

2.2.4 LED lighting shall be installed to ensure uniform backlit illumination without shadow patches or flickering.

2.3 Electrical Installation

2.3.1 All electrical wiring shall be concealed/protected and installed in compliance with safety standards.

2.3.2 Proper earthing and protection devices shall be provided to ensure safety against electrical hazards.

2.3.3 The system shall be tested for proper illumination, load performance and safety before commissioning.

2.4 Installation

2.4.1 The kiosk shall be installed firmly at designated locations with proper foundation or pole mounting arrangements as required.

2.4.2 The installation shall be levelled, aligned and integrated with surrounding site conditions.

2.4.3 Any damage during transport or installation shall be rectified or replaced by the contractor at his own cost.

2.5 Inspection

2.5.1 All kiosks shall be subject to inspection and approval by the Engineer-in-Charge.

2.5.2 Only units conforming to approved design, illumination quality, structural strength and finishing shall be accepted for payment.

3.0 Mode of Measurement and Payment

3.1 The illuminated advertising kiosks shall be measured in numbers (each complete and installed unit).

3.2 The rate shall include cost of materials, fabrication, LED lighting system, electrical fittings, painting/coating, transportation, installation, testing, commissioning, and all labour, tools and incidental charges.

3.3 No extra payment shall be made for foundations, minor adjustments, electrical connections or maintenance during installation.

3.4 The rate shall be for a unit of One Number (No.) of Illuminated Advertising Kiosk complete in all respects.

Item No.40

Providing and laying controlled cement concrete M.200 for curing complete excluding cost of formwork and reinforcement for reinforced concrete work in (C) Slabs,landing,shelves,Balconies Lintels, Beams, Girders and Cantilever upto floor two level.

1.0 Materials

1.1 Cement concrete shall be of M-200 grade (controlled concrete) prepared from approved design mix conforming to relevant IS specifications.

1.2 Cement, fine aggregate, coarse aggregate and water shall be of approved quality and from approved sources.

1.3 Aggregates shall be clean, hard, durable and free from dust, clay, organic matter and other deleterious substances.

1.4 Water used for mixing and curing shall be clean and potable quality.

1.5 Admixtures, if used, shall be of approved quality and used strictly as per manufacturer's recommendations and Engineer-in-Charge approval.

2.0 Workmanship

2.1 Mixing

2.1.1 Concrete shall be machine mixed in a calibrated batch mixer to ensure uniformity and desired strength.

2.1.2 The design mix for M-200 grade shall be strictly followed.

2.1.3 Hand mixing shall not be permitted unless specifically approved by the Engineer-in-Charge.

2.2 Laying and Compaction

2.2.1 Concrete shall be placed in position within the initial setting time to avoid cold joints.

2.2.2 It shall be laid in layers of suitable thickness and compacted using mechanical vibrators.

2.2.3 Proper care shall be taken to ensure full compaction without segregation, honeycombing or displacement of reinforcement.

2.2.4 Concrete shall be finished to required levels, slopes and surfaces as per drawings.

2.3 Curing

2.3.1 Fresh concrete shall be cured by ponding, wet coverings or approved curing methods immediately after initial setting.

2.3.2 Curing shall be continued for the period specified in relevant IS codes or as directed by the Engineer-in-Charge.

2.3.3 Proper protection shall be provided to prevent damage during curing.

2.4 Scope of Work

2.4.1 The work shall include RCC in slabs, landings, shelves, balconies, lintels, beams, girders and cantilever members.

2.4.2 The work shall be carried out up to floor two level only unless otherwise specified.

2.5 Exclusions

2.5.1 Cost of formwork and reinforcement steel is excluded from this item and shall be measured and paid separately.

3.0 Mode of Measurement and Payment

3.1 Concrete shall be measured in cubic metres (m³) of finished work in position.

3.2 The rate shall include cost of materials, mixing, placing, vibration, finishing and curing.

3.3 The rate shall also include labour, tools, equipment, transportation, scaffolding (up to two floors), and all incidental charges.

3.4 No extra payment shall be made for wastage, leakage or minor adjustments during execution.

3.5 The rate shall be for a unit of One Cubic Metre (m³).

Item No.41

Providing formwork of ordinary timber planking so as to give a rough finish including centering shuttering strutting and propping etc. Height of propping and centering below supporting floor to ceiling not exceeding 4 M. and removal of the same for in situ reinforced concrete and plain concrete work in. (B) Flat surfaces such as soffits of suspended floors slabs Landings and the like. (H) (1) Sides and soffits of Beams Beam Haunchings cantilevers Girders Bressumers and Lintels not exceeding 1 M. in Depth1.0. Materials and Workmanship

1.0 Materials

1.1 Timber planks used for formwork shall be sound, well-seasoned, straight, free from warping, decay, cracks and other defects.

1.2 Supporting members such as props, struts, walers and bracings shall be of suitable timber/steel sections of adequate strength and rigidity.

1.3 Nails, screws, clamps and other fixing accessories shall be of approved quality and suitable for formwork operations.

1.4 Formwork materials shall be capable of providing required shape, line, level and surface finish to concrete.

2.0 Workmanship

2.1 General

2.1.1 The formwork shall be designed and erected to withstand all loads and pressures due to fresh concrete, construction loads and vibrations without any deformation.

2.1.2 The formwork shall be true to line, level, shape and dimensions as shown in drawings.

2.1.3 All joints shall be tight to prevent leakage of cement slurry.

2.2 Erection of Formwork

2.2.1 Formwork shall be properly aligned and securely supported with adequate strutting, propping and bracing.

2.2.2 For slabs, landings and similar flat surfaces, soffit formwork shall be provided with proper supports ensuring level finish.

2.2.3 For beams, girders, cantilevers, lintels and similar members, sides and soffits shall be properly framed and supported.

2.2.4 Propping height shall not exceed 4.0 m from supporting floor to ceiling unless otherwise specified.

2.3 Surface Finish Requirement

2.3.1 Formwork shall be erected in such a manner as to provide rough finish to concrete surface unless otherwise specified.

2.3.2 No gaps or openings shall be left which may cause leakage of cement slurry.

2.4 Removal of Formwork

2.4.1 Formwork shall be removed only after concrete has attained sufficient strength to safely support itself.

2.4.2 Removal shall be carried out carefully to avoid damage to concrete surfaces.

2.4.3 Removed materials shall be cleaned and stacked properly for reuse or disposal.

2.5 Scope of Work

2.5.1 The item includes formwork for flat surfaces such as soffits of slabs, landings, and similar works.

2.5.2 It also includes sides and soffits of beams, beam haunchings, cantilevers, girders, bressumers and lintels up to 1.0 m depth.

3.0 Mode of Measurement and Payment

3.1 Formwork shall be measured in square metres (m²) of actual surface area in contact with concrete.

3.2 The rate shall include cost of materials, labour, erection, strutting, centering, propping, shuttering, dismantling and removal.

3.3 The rate shall also include all tools, scaffolding, wastage, transportation and incidental charges.

3.4 No extra payment shall be made for minor adjustments, supports or reuse of materials.

3.5 The rate shall be for a unit of One Square Metre (m²).

Item No.42

Clearing and grubbing road land including uprooting rank vegetation grass bushes, shrubs, sapling and trees girth up to 300 mm removal of stumps of trees cut earlier and disposal of unserviceable materials(A) By manual means in area of light jungle

1.0 Materials / Requirements

1.1 The site shall include areas covered with light jungle vegetation such as grasses, bushes, shrubs, saplings, and small trees up to 300 mm girth.

1.2 All tools, equipment, and labour required for manual clearing, grubbing, cutting, uprooting, and disposal shall be arranged by the contractor.

1.3 Suitable arrangements for disposal of cleared materials shall be made in approved dumping locations as directed by the Engineer-in-Charge.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of complete clearing and grubbing of vegetation and obstructions from road land to make the area free from all organic growth and debris.

2.1.2 The operation shall be carried out carefully to ensure complete removal of roots, stumps, and vegetative growth without disturbing the underlying ground more than necessary.

2.2 Clearing and Uprooting

2.2.1 All rank vegetation including grass, bushes, shrubs, saplings, and small trees up to 300 mm girth shall be uprooted completely along with their root systems.

2.2.2 Tree stumps of earlier cut trees shall be removed entirely from the ground.

2.2.3 The site shall be made free from all loose organic matter and debris resulting from clearing operations.

2.3 Disposal

2.3.1 All unserviceable materials shall be collected, loaded, transported and disposed of at approved disposal sites.

2.3.2 Burning of debris at site shall not be permitted unless specifically approved by the Engineer-in-Charge.

2.3.3 The site shall be left clean, levelled and free from any hazardous or obstructive material.

3.0 Mode of Measurement and Payment

3.1 The clearing and grubbing work shall be measured in square metres (m²) of actual area cleared.

3.2 The rate shall include uprooting vegetation, cutting and removal of bushes and trees up to 300 mm girth, removal of stumps, loading, transportation, and disposal of unserviceable materials.

3.3 The rate shall also include all labour, tools, equipment, leads and lifts, and incidental operations required for complete execution of the work.

3.4 No extra payment shall be made for minor excavation, surface dressing, or removal of scattered debris within the specified area.

3.5 The rate shall be for a unit of One Square Metre (m²).

Item No.43

Earthwork for embankment including breaking clods, dressing with all lead and lift (excluding watering and consolidation)(E) From Borrow area within 3.0 Km. lead

1.0 Materials

1.1 Suitable soil shall be obtained from approved borrow areas and shall be free from organic matter, roots, grass, stones, brick bats and other deleterious materials.

1.2 The material shall be suitable for embankment construction and shall conform to required specifications of embankment filling as approved by the Engineer-in-Charge.

1.3 The borrow area shall be arranged by the contractor and shall be approved prior to extraction.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of excavation of earth from borrow area, transportation, spreading, dressing and formation of embankment in layers as per required alignment, levels and cross section.

2.1.2 The embankment shall be formed true to lines, levels, grades and slopes as shown in drawings or as directed by the Engineer-in-Charge.

2.2 Excavation and Transportation

2.2.1 Earth shall be excavated from approved borrow areas within a lead of 3.0 km.

2.2.2 The excavated material shall be loaded, transported and unloaded carefully to avoid segregation and loss.

2.2.3 No extra payment shall be made for handling within the specified lead.

2.3 Spreading and Dressing

2.3.1 The earth shall be spread in uniform layers of suitable thickness as directed at site.

2.3.2 Clods shall be broken properly and the material shall be dressed to required embankment profile.

2.3.3 The embankment shall be finished smooth and to proper slope and camber as required.

2.4 Exclusions

2.4.1 Watering and compaction/consolidation of earthwork shall not be included in this item and shall be measured and paid separately.

3.0 Mode of Measurement and Payment

3.1 The earthwork in embankment shall be measured in cubic metres (m³) based on finished compacted embankment volume.

3.2 The rate shall include excavation from borrow area, loading, unloading, transportation within 3.0 km lead, spreading, breaking of clods and dressing.

3.3 The rate shall include all labour, tools, equipment, haulage, leads and lifts, and incidental operations required for completion.

3.4 No extra payment shall be made for variation within specified lead or minor adjustments in formation.

3.5 The rate shall be for a unit of One Cubic Metre (m³).

Item No.44

Providing Loam or clay soil of approved quantity on site

1.0 Materials

1.1 The loam or clay soil shall be of approved quality, fertile, and suitable for plantation and landscaping works.

1.2 The soil shall be free from stones, brick bats, rubbish, weeds, roots, organic waste, harmful salts and any other deleterious materials.

1.3 The moisture content of soil shall be such that it remains workable and suitable for spreading and plantation activities.

1.4 The soil shall be sourced from approved borrow areas or suppliers and shall be subject to approval by the Engineer-in-Charge before use.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of providing, transporting, unloading and stacking of loam or clay soil at site as per requirement.

2.1.2 The soil shall be handled in such a manner to avoid contamination, segregation or loss of fine particles.

2.2 Transportation and Handling

2.2.1 The soil shall be transported from approved source to site with proper care to maintain its quality.

2.2.2 Loading and unloading shall be done carefully to avoid mixing with unsuitable materials.

2.2.3 The soil shall be stacked neatly at designated locations without causing obstruction to other site activities.

2.3 Quality Control

2.3.1 The soil shall be subject to inspection and approval by the Engineer-in-Charge before stacking and use.

2.3.2 Any rejected material shall be removed from site and replaced by the contractor at his own cost.

3.0 Mode of Measurement and Payment

3.1 The loam or clay soil shall be measured in cubic metres (m³) of material supplied and stacked at site.

3.2 The rate shall include cost of soil, excavation at source, loading, transportation, unloading, stacking and all handling charges.

3.3 The rate shall also include all labour, tools, equipment, leads and lifts, and incidental charges required for completion of work.

3.4 No extra payment shall be made for wastage, segregation or minor site handling.

3.5 The rate shall be for a unit of One Cubic Metre (m³).

Item No.45

Providing pure doob grass suckers and planting the same at a distance of 8 to 10 cm. both ways and maintaining the same till well established.(about 45 days)

1.0 Materials

1.1 The Doob grass suckers shall be fresh, healthy, disease-free and of pure variety (Cynodon dactylon), free from weeds, other grass species and impurities.

1.2 The suckers shall have sufficient rooting material to ensure quick establishment and uniform growth.

1.3 The planting material shall be obtained from approved source and shall be subject to approval by the Engineer-in-Charge before use.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of providing, supplying, planting and maintaining Doob grass suckers at site including all operations required for proper establishment of turf.

2.1.2 The surface shall be prepared to a fine tilth, free from weeds, stones and debris before planting.

2.2 Planting

2.2.1 The Doob grass suckers shall be planted at a spacing of 8 cm to 10 cm both ways in a uniform grid pattern.

2.2.2 The suckers shall be inserted firmly into the soil ensuring proper root-to-soil contact.

2.2.3 After planting, the surface shall be lightly pressed and watered immediately to ensure proper establishment.

2.3 Maintenance

2.3.1 The planted area shall be maintained regularly by watering, weeding and gap filling to ensure uniform turf coverage.

2.3.2 Any dry, dead or damaged patches shall be replaced immediately at contractor's own cost.

2.3.3 Maintenance shall be carried out for a period of about 45 days or until the grass is fully established, whichever is later.

2.3.4 The turf shall be kept in healthy, green and uniform condition throughout the maintenance period.

3.0 Mode of Measurement and Payment

3.1 The work shall be measured in square metres (m²) of actual area planted with Doob grass and accepted after establishment.

3.2 The rate shall include cost of grass suckers, preparation of soil, planting at specified spacing, watering, maintenance for 45 days, gap filling and all incidental operations.

3.3 The rate shall also include labour, tools, equipment, watering arrangements and protection of planted area.

3.4 No extra payment shall be made for maintenance, replacement of failed patches or watering during the establishment period.

3.5 The rate shall be for a unit of One Square Metre (m²).

Item No.46

Demolition of brick work and stone masonry including stacking of serviceable materials and disposal of unserviceable materials with all leads and lifts in lime mortar.

1.0. Workmanship

1.1. The relevant specifications of Item No. 20.1 (i) shall be followed except that demolition of brick work or stone masonry laid in lime mortar shall be carried out under this item.

1.2. Demolition shall be executed carefully so as to avoid damage to adjoining structures and serviceable materials intended for reuse.

1.3. Serviceable bricks, stones and other reusable materials obtained from demolition shall be carefully removed, cleaned of loose mortar where required and stacked as directed by the Engineer-in-Charge.

1.4. Unserviceable materials, rubbish and debris arising out of demolition shall be removed from the site and disposed of as directed with all leads and lifts.

2.0. Mode of Measurements and Payment

2.1. The relevant specifications of Item No. 20.1 (i) shall be followed except that walls, independent piers and columns of brick work or stone masonry shall be measured in cubic meters. Copings, corbels, cornices and other projections shall be included in the measurements of the wall.

2.2. In measuring the thickness of plastered walls, the thickness of plaster shall be included. Unserviceable materials shall be disposed of with all leads and lifts.

2.3. Ashlar masonry, face stones, dressed stones and similar work required to be taken down intact shall be dismantled carefully and measured separately in cubic meters.

2.4. The rate shall be exclusive of cleaning of bricks or stones unless otherwise specified.

2.5. Honeycomb work, cavity walls and hollow block masonry shall be measured as solid masonry.

2.6. The rate shall include demolition, sorting, stacking of serviceable materials, disposal of unserviceable materials, labour, tools, plants and all incidental charges necessary for completion of the work.

2.7. The rate shall be for a unit of one cubic meter.

Item No.47

Dismantling steel work including dismembering and stacking the materials with all leads and lifts.

1.0. Materials

1.1. The relevant specifications of Item No. 20.1 (i) shall be followed except that dismantling of steel work shall be carried out under this item.

2.0. Mode of Measurements and Payment

2.1. The relevant specifications of Item No. 20.1 (i) shall be followed.

2.2. The weight of the members shall be computed from standard tables unless the actual weight can be readily determined.

2.3. In riveted work, where rivets are required to be cut, the same shall be deemed to be included in this item and no extra payment shall be made.

2.4. In framed steel gates, the weight of any covering material or filling such as iron sheets, expanded metal or similar materials shall be added to the weight of the main article if such covering is not ordered to be dismantled separately.

2.5. The rate shall include dismantling, dismembering, sorting and stacking of materials at places directed by the Engineer-in-Charge, including all leads and lifts.

2.6. The rate shall include all labour, tools, plants and incidental charges required for completion of the work.

2.7. The rate shall be for a unit of one kilogram.

Item No.48

Excavation for foundation up to 1.5 m depth including sorting out and stacking of useful materials and disposing of the excavated stuff up to 50 meter lead in loose or soft soil.

1.0. General

1.1. Any soil which generally yields to the application of pickaxes, shovels, phawaras, rakes or any other ordinary excavating implements, including organic soil, gravel, silt, sand, turf, loam, clay, peat, etc., shall fall under this category.

2.0. Clearing the Site

2.1. The site on which the structure is to be built shall be cleared of all obstructions, loose stones, materials, rubbish, bushes, wood and trees as directed by the Engineer-in-Charge. The materials so obtained shall remain the property of the Government and shall be conveyed and stacked as directed within a lead of 50 m. The roots of trees occurring within the excavation area shall be cut and coated with hot asphalt.

2.2. The rate for site clearance shall be deemed to be included in the rate of earthwork and no extra payment shall be made on this account.

3.0. Setting Out

3.1. After clearing the site, the centre lines shall be given by the Engineer-in-Charge. The contractor shall assume full responsibility for the alignment, elevations and dimensions of all parts of the work.

3.2. The contractor shall provide all labour, materials and equipment required for setting out reference marks and bench marks and shall maintain the same for the duration of the work as directed.

4.0. Excavation

4.1. Excavation for foundations shall be carried out to the true lines, levels, widths and depths shown on the drawings or as directed by the Engineer-in-Charge.

4.2. The contractor shall provide all necessary shoring, sheeting, strutting or side slopes required for safety and stability of the excavation at his own cost unless otherwise specified.

4.3. The bottom of the excavation shall be properly leveled both longitudinally and transversely and watered and dressed as required.

4.4. No earth filling shall be permitted for bringing the excavation to the required level. If excavation is carried out deeper or wider than specified, the excess depth or width shall be made good with concrete of the same proportion as specified for foundation concrete at the contractor's own cost.

4.5. Excavation up to 1.5 m depth shall be measured and paid under this item.

5.0. Disposal of Excavated Stuff

5.1. Suitable excavated material approved by the Engineer-in-Charge shall be utilized for filling trenches, plinths or leveling the ground in layers including watering and ramming complete.

5.2. The surplus excavated material shall be removed by the contractor from the site of work and disposed of at a location directed by the Engineer-in-Charge within a lead of 50 m and all lifts.

6.0. Mode of Measurements and Payment

6.1. Excavation in foundation trenches shall be measured according to the sections shown on the drawings or as directed by the Engineer-in-Charge. No payment shall be made for surplus excavation beyond the specified dimensions or for excavation resulting from side sloping required for safety or due to soil conditions.

6.2. The rate shall include site clearance, setting out, excavation, dressing, sorting and stacking of useful materials, disposal of surplus excavated earth within specified lead and all labour, tools, plants and incidental charges required for completion of the work.

6.3. The rate shall be for a unit of one cubic meter.

Item No. 49

Providing and laying cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) and curing complete excluding the cost of form work in foundations and plinth.

1.0. Materials

1.1. Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Stone aggregate of 40 mm nominal size shall conform to M-12.

2.0. Workmanship

2.1. General

2.1.1. Before starting concrete work, the bed of foundation trenches shall be cleared of all loose materials, properly leveled, watered and rammed as directed by the Engineer-in-Charge.

2.2. Proportion of Mix

2.2.1. The proportion of cement, sand and coarse aggregate shall be one part cement, three parts coarse sand and six parts graded stone aggregate by volume.

2.3. Mixing

2.3.1. Concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may be permitted for small quantities of work with the approval of the Engineer-in-Charge.

2.3.2. When hand mixing is permitted due to breakdown of machinery or in the interest of work, it shall be carried out on a watertight platform. Mixing shall continue until the mass becomes uniform in colour and consistency.

2.3.3. In case of hand mixing, 10 percent additional cement shall be used over the specified quantity.

2.3.4. Mixing shall continue for a period of not less than 1½ to 2 minutes. The quantity of water added shall be only that required to produce dense concrete of the required workability.

2.4. Transporting and Placing of Concrete

2.4.1. Concrete shall be transported from the place of mixing to its final position within 15 minutes and shall be placed, compacted and finished within 30 minutes after mixing with water, before the initial setting of cement commences.

2.4.2. Concrete shall be laid in layers not exceeding 15 cm to 20 cm in thickness.

2.5. Compaction

2.5.1. Concrete shall be compacted by thorough ramming with heavy iron rammers to ensure proper compaction and complete filling of all voids and interstices with mortar.

2.6. Curing

2.6.1. After the final set, the concrete shall be kept continuously wet by ponding or other approved methods for a period of not less than seven days from the date of placement.

2.7. Mode of Measurements and Payment

2.7.1. Concrete shall be measured in cubic meters based on the length, breadth and depth, limited to the dimensions shown on the drawings or as directed by the Engineer-in-Charge.

2.7.2. The rate shall include the cost of all materials, labour, tools, plants, mixing, transporting, laying, compacting, curing and all incidental charges necessary for completion of the work, excluding the cost of form work.

2.7.3. The rate shall be for a unit of one cubic meter.

Item No. 50

Pre cast concrete kerb Providing & fixing M30 grade of concrete factory made precast exposed/ fair finish kerb stones of approved make and as per sample approved of any sizes, any shape. Kerbs shall be fixed on the foundation prepared of M15 grade concrete as of approved design including excavation, curing, formwork (if required), flush pointing in CM (1:2) for all joints of the kerbstones etc. complete. The rate shall also include for erecting and fixing the pieces in position for complete kerb systems with Chamfered type/ pencil corner kerbs including necessary accessories of kerb like radius kerbs, corner kerb, quadrant kerbs, drain out kerb, flat kerb, parking edge kerb, ramp kerb, etc complete as per drawing. Precast kerb shall be protect with good quality plastic sheet for protection against bituminous/ concrete work. The rate shall include the cost of base excavation, base PCC M15 grade, joining, curing, protection etc complete as directed by engineer in charge. Rate shall be unit of One Cum. For the payment, kerb volume shall be considered. (Sample must be approved).

1.0 Materials

1.1 Kerb stones shall be factory-made precast concrete of M30 grade, from approved manufacturer and conforming to approved sample.

1.2 The kerbs shall have smooth exposed/fair finish surface, free from cracks, honeycombing or surface defects.

1.3 Foundation concrete shall be of M15 grade PCC of approved mix design.

1.4 Cement mortar for jointing shall be in proportion 1:2 (cement : sand) using approved materials.

1.5 All kerb types including straight, radius, corner, drain, ramp and parking edge kerbs shall be supplied as per approved drawings.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of excavation, preparation of base, laying of PCC foundation, placing of precast kerbstones, alignment, jointing, curing and protection.

2.1.2 All kerb stones shall be installed strictly as per approved layout, line, level and gradient.

2.2 Excavation and Base Preparation

2.2.1 Excavation shall be carried out to required depth and profile for laying PCC foundation.

2.2.2 The base shall be properly compacted and dressed before laying M15 PCC.

2.2.3 Any loose soil shall be removed and proper bedding shall be ensured.

2.3 Laying of Foundation

2.3.1 M15 grade PCC shall be laid as foundation for kerb stones in required line and level.

2.3.2 The PCC shall be properly compacted, finished and cured before fixing kerb stones.

2.4 Fixing of Kerb Stones

2.4.1 Precast kerb stones shall be carefully placed over the PCC bed maintaining proper alignment, slope and level.

2.4.2 Kerbs shall be fixed firmly in position ensuring uniform joints and correct geometry.

2.4.3 All types of kerbs including chamfered, radius, corner and special kerbs shall be installed as per approved drawings.

2.5 Jointing and Finishing

2.5.1 Joints between kerbstones shall be filled and flush pointed with cement mortar 1:2.

2.5.2 The finished joints shall be smooth, uniform and properly cured.

2.6 Protection and Curing

2.6.1 Installed kerbs shall be properly cured and protected from damage.

2.6.2 Kerbs shall be covered with approved plastic sheet or protective material during adjoining works such as bituminous or concrete laying.

3.0 Mode of Measurement and Payment

3.1 The kerb work shall be measured in cubic metres (m³) based on the actual volume of precast kerb installed in position.

3.2 The rate shall include cost of precast M30 kerb stones, excavation, M15 PCC foundation, fixing, alignment, jointing, curing, protection and all incidental works.

3.3 No extra payment shall be made for different shapes such as radius, corner, drain-out, ramp or special kerb pieces.

3.4 The rate shall include labour, materials, tools, equipment, transportation and all leads and lifts.

3.5 The rate shall be for a unit of One Cubic Metre (m³).

Item No. 51

Filling in foundation and plinth with murrum or selected soil in layers of 20 cm thickness including watering, ramming and consolidating etc., complete.

1.0 Materials

1.1 Murrum or selected soil shall be of approved quality, free from organic matter, roots, grass, stones, brick bats and other deleterious materials.

1.2 The filling material shall be well graded and suitable for compaction in layers.

1.3 The material shall be obtained from approved source and shall be subject to approval of the Engineer-in-Charge before use.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of filling in foundation and plinth with approved murrum or selected soil in layers, including all operations required for proper compaction.

2.1.2 Filling shall be carried out in uniform layers not exceeding 20 cm thickness.

2.2 Spreading and Layering

2.2.1 The material shall be spread evenly in layers and brought to required level and slope.

2.2.2 Each layer shall be properly levelled before watering and compaction.

2.3 Watering and Compaction

2.3.1 Each layer shall be adequately watered as required to achieve optimum moisture content for compaction.

2.3.2 After watering, each layer shall be thoroughly rammed and compacted using suitable mechanical or manual means to achieve proper consolidation.

2.3.3 Care shall be taken to ensure uniform compaction without leaving voids or loose pockets.

2.4 Finishing

2.4.1 The filled surface shall be properly dressed to required level and grade.

2.4.2 Any settlement observed during or after compaction shall be made good by additional filling and compaction.

3.0 Mode of Measurement and Payment

- 3.1** The filling work shall be measured in cubic metres (m³) of consolidated fill in position.
- 3.2** The rate shall include cost of murrum/selected soil, loading, transportation, spreading, watering, ramming and compaction.
- 3.3** The rate shall also include labour, tools, equipment, leads and lifts, and all incidental charges.
- 3.4** No extra payment shall be made for watering, compaction or minor settlement corrections.
- 3.5** The rate shall be for a unit of One Cubic Metre (m³).

Item No. 52

Wall painting (two coats) with plastic emulsion paint of approved brand and manufacture on undecorated wall surfaces to give an even shade including thoroughly brushing the surface free from mortar droppings and other foreign matter and making the surface smooth with sand paper.

1.0 Materials

- 1.1** Plastic emulsion paint shall conform to IS 5411 (Part-I) and shall be of approved brand, manufacture and shade.
- 1.2** Water used for thinning, if required, shall be clean and free from impurities.
- 1.3** Primer, if required as per site condition, shall be of approved quality.

2.0 Workmanship

2.1 Surface Preparation

- 2.1.1** The wall surface shall be thoroughly cleaned of mortar droppings, dust, dirt, grease and all foreign matter.
- 2.1.2** The surface shall be made smooth by rubbing with sand paper to obtain an even and uniform base.
- 2.1.3** All cracks, holes and surface imperfections shall be properly filled and made good before painting.

2.2 Application of Paint

- 2.2.1** Two coats of plastic emulsion paint shall be applied evenly to achieve a smooth, uniform and consistent shade.
- 2.2.2** Each coat shall be applied only after the previous coat has dried sufficiently.
- 2.2.3** The paint shall be thoroughly stirred before and during application to maintain uniform consistency.
- 2.2.4** Application shall be done using brush or roller as approved, ensuring uniform spreading without patches or uneven shade.

2.3 Finishing

- 2.3.1** The finished surface shall be smooth, uniform in colour and free from brush marks, streaks, patches, peeling or other defects.

2.3.2 Special care shall be taken at corners, edges and junctions to ensure neat finish.

2.4 Protection

2.4.1 Painted surfaces shall be protected from dust, moisture and damage until fully dry.

2.4.2 Any defective work shall be rectified by the contractor at his own cost.

3.0 Mode of Measurement and Payment

3.1 Measurement shall be made in square metres (m²) of actual painted surface completed.

3.2 The rate shall include cost of materials, surface preparation, sand papering, application of two coats of plastic emulsion paint and finishing.

3.3 The rate shall also include labour, tools, scaffolding, wastage, transportation and all incidental charges.

3.4 No extra payment shall be made for minor touch-ups or overlapping areas.

3.5 The rate shall be for a unit of One Square Metre (m²).

Item No. 53

Providing loam or clay soil of approved quantity on site

1.0 Materials

1.1 The loam or clay soil shall be of approved quality, fertile and suitable for plantation, turfing and landscaping works.

1.2 The soil shall be free from stones, brick bats, rubbish, weeds, roots, organic waste, harmful salts and any other deleterious materials.

1.3 The soil shall be properly workable with good moisture retention and drainage characteristics suitable for plant growth.

1.4 The soil shall be obtained from approved source and shall be subject to approval of the Engineer-in-Charge before use at site.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of providing, transporting, unloading and stacking of loam or clay soil at site in required quantity.

2.1.2 The soil shall be handled carefully to avoid contamination, segregation or loss of fine particles.

2.2 Transportation and Stacking

2.2.1 The soil shall be transported from approved source to site in suitable vehicles.

2.2.2 Loading and unloading shall be done carefully to maintain quality and avoid mixing with unsuitable materials.

2.2.3 The soil shall be stacked neatly at designated locations without causing obstruction to site activities.

2.3 Quality Control

2.3.1 The soil shall be subject to inspection and approval by the Engineer-in-Charge before acceptance.

2.3.2 Any rejected material shall be removed from site and replaced by the contractor at his own cost.

3.0 Mode of Measurement and Payment

3.1 The loam or clay soil shall be measured in cubic metres (m³) of material supplied, stacked and accepted at site.

3.2 The rate shall include cost of soil, excavation at source, loading, transportation, unloading, stacking and all handling charges.

3.3 The rate shall also include labour, tools, equipment, leads and lifts, and all incidental charges required for completion of work.

3.4 No extra payment shall be made for wastage, segregation or site handling.

3.5 The rate shall be for a unit of One Cubic Metre (m³).

Item No. 54

Providing well grown saplings of specified species and planting the same as directed and maintaining till well established (About 45 days)

1.0 Materials

1.1 The saplings shall be of specified species, healthy, vigorous, disease-free and free from pests, mechanical damage or deformities.

1.2 The saplings shall have well-developed root system and shall be suitable for transplantation and field growth.

1.3 The planting material shall be obtained from approved nurseries only and shall be subject to approval of the Engineer-in-Charge before planting.

1.4 The saplings shall be of uniform size and growth stage suitable for landscape plantation.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of supplying, transporting, planting and maintaining saplings at site including all operations necessary for their proper establishment.

2.1.2 Planting shall be carried out at locations, spacing and pattern as directed by the Engineer-in-Charge.

2.2 Planting Operation

2.2.1 Pits of required size shall be prepared, filled with suitable soil mix and properly dressed before planting.

2.2.2 Saplings shall be planted carefully ensuring proper root placement and firm soil compaction around the root zone.

2.2.3 Immediate watering shall be done after planting to ensure proper settlement and survival.

2.3 Maintenance

2.3.1 The planted saplings shall be regularly watered, weeded and maintained in healthy condition.

2.3.2 Any dead, damaged or failed saplings shall be replaced by the contractor at his own cost.

2.3.3 Maintenance shall be carried out for a period of about 45 days or until the plants are fully established, whichever is later.

2.3.4 Protective measures shall be taken against grazing, vandalism, pests and adverse weather conditions.

3.0 Mode of Measurement and Payment

3.1 The work shall be measured in numbers (each sapling planted and successfully established).

3.2 The rate shall include cost of saplings, transportation, planting, pit preparation, soil mix, watering, maintenance for 45 days and replacement of failed plants.

3.3 The rate shall also include labour, tools, equipment and all incidental charges required for complete execution.

3.4 No extra payment shall be made for maintenance, watering or replacement during the establishment period.

3.5 The rate shall be for a unit of One Number (No.) of sapling.

Item No. 55

Clearing and grubbing road land including uprooting rank vegetation grass bushes, shrubs, sapling and trees girth up to 300 mm removal of stumps of trees cut earlier and disposal of unserviceable materials(A) By manual means in area of light jungle

1.0 Materials / Requirements

1.1 The site shall include areas covered with light jungle vegetation such as grasses, bushes, shrubs, saplings, and small trees up to 300 mm girth.

1.2 All tools, equipment, and labour required for manual clearing, grubbing, cutting, uprooting, and disposal shall be arranged by the contractor.

1.3 Suitable arrangements for disposal of cleared materials shall be made in approved dumping locations as directed by the Engineer-in-Charge.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of complete clearing and grubbing of vegetation and obstructions from road land to make the area free from all organic growth and debris.

2.1.2 The operation shall be carried out carefully to ensure complete removal of roots, stumps, and vegetative growth without disturbing the underlying ground more than necessary.

2.2 Clearing and Uprooting

2.2.1 All rank vegetation including grass, bushes, shrubs, saplings, and small trees up to 300 mm girth shall be uprooted completely along with their root systems.

2.2.2 Tree stumps of earlier cut trees shall be removed entirely from the ground.

2.2.3 The site shall be made free from all loose organic matter and debris resulting from clearing operations.

2.3 Disposal

2.3.1 All unserviceable materials shall be collected, loaded, transported and disposed of at approved disposal sites.

2.3.2 Burning of debris at site shall not be permitted unless specifically approved by the Engineer-in-Charge.

2.3.3 The site shall be left clean, levelled and free from any hazardous or obstructive material.

3.0 Mode of Measurement and Payment

3.1 The clearing and grubbing work shall be measured in square metres (m²) of actual area cleared.

3.2 The rate shall include uprooting vegetation, cutting and removal of bushes and trees up to 300 mm girth, removal of stumps, loading, transportation, and disposal of unserviceable materials.

3.3 The rate shall also include all labour, tools, equipment, leads and lifts, and incidental operations required for complete execution of the work.

3.4 No extra payment shall be made for minor excavation, surface dressing, or removal of scattered debris within the specified area.

3.5 The rate shall be for a unit of One Square Metre (m²).

Item No. 56

Excavation for foundation up to 1.5 m depth including sorting out and stacking of useful materials and disposing of the excavated stuff up to 50 meter lead in loose or soft soil.

1.0. General

1.1. Any soil which generally yields to the application of pickaxes, shovels, phawaras, rakes or other ordinary excavating implements, including organic soil, gravel, silt, sand, turf, loam, clay and peat, shall be classified as loose or soft soil under this item.

2.0. Clearing the Site

2.1. The site on which the structure is to be built shall be cleared of all obstructions, loose stones, materials, rubbish, bushes, wood and trees as directed by the Engineer-in-Charge. Materials obtained from site clearance shall remain the property of the Government and shall be conveyed and stacked as directed within a lead of 50 m. Tree roots encountered within the excavation area shall be cut and coated with hot asphalt.

2.2. The cost of site clearance shall be deemed to be included in the rate of earthwork and no extra payment shall be made on this account.

3.0. Setting Out

3.1. After clearing the site, the centre lines shall be given by the Engineer-in-Charge. The contractor shall be fully responsible for the correct alignment, levels and dimensions of all parts of the work.

3.2. The contractor shall provide all labour, materials and equipment necessary for setting out reference marks and bench marks and shall maintain them in proper condition throughout the execution of the work.

4.0. Excavation

4.1. Excavation for foundations shall be carried out to the true lines, levels, widths and depths shown on the drawings or as directed by the Engineer-in-Charge.

4.2. The contractor shall provide all necessary shoring, sheeting, strutting or side slopes required for safety and stability of the excavation at his own cost unless otherwise specified.

4.3. The bottom of the excavation shall be properly dressed, watered and leveled both longitudinally and transversely as directed.

4.4. No earth filling shall be permitted for bringing the excavation to the required level. If excavation is carried deeper or wider than specified, the excess depth or width shall be made good with concrete of the same grade as specified for foundation concrete at the contractor's own cost.

4.5. Excavation up to 1.5 m depth shall be measured and paid under this item.

5.0. Disposal of Excavated Stuff

5.1. Suitable excavated material approved by the Engineer-in-Charge shall be utilized for filling trenches, plinth filling or leveling the ground in layers including watering and ramming complete.

5.2. Surplus excavated material shall be removed from the site and disposed of at locations directed by the Engineer-in-Charge within a lead of 50 m and all lifts.

6.0. Mode of Measurements and Payment

6.1. Excavation in foundation trenches shall be measured according to the sections shown on the drawings or as directed by the Engineer-in-Charge. No payment shall be made for excavation carried out beyond the specified dimensions or for extra excavation resulting from side sloping required for safety or due to soil conditions.

6.2. The rate shall include site clearance, setting out, excavation, dressing, sorting and stacking of useful materials, disposal of surplus earth within the specified lead, and all labour, tools, plants and incidental charges necessary for completion of the work.

6.3. The rate shall be for a unit of one cubic meter.

Item No. 57

Providing and laying cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) and curing complete excluding the cost of form work in foundations and plinth.

1.0 Materials

1.1. Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Stone aggregate of 40 mm nominal size shall conform to M-12.

2.0 Workmanship

2.1 General

2.1.1. Before starting concrete work, the bed of foundation trenches shall be cleared of all loose materials, properly leveled, watered and rammed as directed by the Engineer-in-Charge.

2.2 Proportion of Mix

2.2.1. The proportion of cement, sand and coarse aggregate shall be one part cement, three parts coarse sand and six parts graded stone aggregate. The materials shall be measured by volume.

2.3 Mixing

2.3.1. Concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may be permitted for small quantities of work with the approval of the Engineer-in-Charge.

2.3.2. When hand mixing is permitted due to breakdown of machinery or in the interest of work, it shall be carried out on a watertight platform. Mixing shall continue until the mass becomes uniform in colour and consistency.

2.3.3. In case of hand mixing, 10 percent additional cement shall be used over the specified quantity.

2.3.4. Mixing shall continue for not less than 1½ to 2 minutes. The quantity of water added shall be only that required to produce dense concrete of the required workability.

2.4 Transporting and Placing of Concrete

2.4.1. Concrete shall be transported from the place of mixing to its final position within 15 minutes and shall be placed, compacted and finished within 30 minutes after mixing with water and before the commencement of initial setting.

2.4.2. Concrete shall be laid in layers of 15 cm to 20 cm thickness.

2.5 Compaction

2.5.1. Concrete shall be compacted by thorough ramming with heavy iron rammers to ensure proper compaction and complete filling of all voids and interstices with mortar.

2.6 Curing

2.6.1. After the final set, the concrete shall be kept continuously wet by ponding or any other approved method for a period of not less than seven days from the date of placement.

2.7 Mode of Measurements and Payment

2.7.1. Concrete shall be measured in cubic meters based on the length, breadth and depth, limited to the dimensions shown on the drawings or as directed by the Engineer-in-Charge.

2.7.2. The rate shall include the cost of all materials, labour, tools, plants, mixing, transporting, laying, compacting, curing and all incidental charges necessary for completion of the work, excluding the cost of form work.

2.7.3. The rate shall be for a unit of **one cubic meter**.

Item No. 58

Providing and laying controlled cement concrete M.200 and curing complete excluding the cost of formwork and reinforcement for reinforced concrete work in (A) Foundations, footings, Base of columns and Mass concrete

1.0 Materials

1.1 Cement concrete shall be of M-200 grade (controlled concrete) prepared from approved mix design.

1.2 Cement, fine aggregate, coarse aggregate and water shall conform to relevant IS specifications and shall be from approved sources.

1.3 Aggregates shall be clean, hard, durable and free from dust, clay, organic and deleterious materials.

1.4 Water used for mixing and curing shall be clean and conforming to potable standards.

1.5 Admixtures, if required, shall be of approved quality and used strictly as per manufacturer's recommendations and Engineer-in-Charge approval.

2.0 Workmanship

2.1 Mixing

2.1.1 Concrete shall be machine mixed in approved batch mixers to ensure uniform consistency.

2.1.2 The mix design shall be strictly followed to achieve M-200 grade strength.

2.1.3 Hand mixing shall not be permitted unless specifically approved by the Engineer-in-Charge.

2.2 Laying and Compacting

2.2.1 Concrete shall be placed in position within specified time after mixing to avoid initial setting.

2.2.2 Concrete shall be laid in layers of suitable thickness and compacted using mechanical vibrators.

2.2.3 Proper care shall be taken to avoid segregation, honeycombing and displacement of reinforcement.

2.2.4 Concrete shall be finished to required levels and slopes as per drawings.

2.3 Curing

2.3.1 Fresh concrete shall be cured properly by ponding, wet coverings or approved curing compounds.

2.3.2 Curing shall be continued for a minimum period as specified in relevant IS codes or as directed by Engineer-in-Charge.

2.3.3 Adequate protection shall be provided to prevent damage during curing period.

2.4 Exclusions

2.4.1 The cost of formwork and reinforcement steel is excluded from this item and shall be measured and paid separately.

3.0 Mode of Measurement and Payment

- 3.1** The concrete shall be measured in cubic metres (m³) of finished work in position.
- 3.2** The rate shall include cost of materials, mixing, placing, compacting, finishing and curing.
- 3.3** The rate shall also include labour, machinery, vibration, handling, transportation and all incidental works required for completion.
- 3.4** No extra payment shall be made for minor wastage, leakage or adjustments during laying.
- 3.5** The rate shall be for a unit of One Cubic Metre (m³).

Item No. 59

Brick work using common burnt clay building bricks having crushing strength not less than 35 Kg/Sq.Cm in foundations and plinth in cement mortar 1:5 (1 cement : 5 fine sand) using modular bricks.

1.0. Materials

1.1. Water shall conform to M-1. Cement shall conform to M-3. Sand shall conform to M-6. Bricks shall conform to M-15. Cement mortar shall conform to M-11.

2.0. Workmanship

2.1. Proportion

2.1.1. The proportion of cement mortar shall be 1:5 (1 cement : 5 fine sand) by volume.

2.2. Wetting of Bricks

2.2.1. The bricks required for masonry shall be thoroughly wetted with clean water for about two hours before use or as directed. The cessation of air bubbles when bricks are immersed in water shall be considered as an indication of thorough wetting.

2.3. Laying

2.3.1. Bricks shall be laid in English bond unless otherwise directed. Half or cut bricks shall not be used except where necessary to complete the bond. Closures shall be cut to the required size and used near the ends of walls.

2.3.2. A layer of mortar shall be spread over the full width of the course. Each brick shall be properly bedded and set in position by gently tapping with the handle of a trowel or wooden mallet. Vertical joints shall be completely filled with mortar.

2.3.3. The masonry shall be carried out truly to line, level and plumb. All courses shall be laid horizontally and all vertical joints shall be truly vertical. Vertical joints in alternate courses shall be staggered to maintain proper bond.

2.3.4. Bricks shall be laid with frogs facing upwards. Suitable tools such as straight edges, spirit levels, squares, measuring rods, pins, strings and plumb bobs shall be kept at site for checking the accuracy of the work.

2.3.5. For walls exceeding 23 cm in thickness, both faces shall be maintained truly in plumb. Connected masonry work shall not be raised more than one meter above the adjoining work. Where this is unavoidable, the work shall be raked back according to bond at an angle not steeper than 45 degrees.

2.3.6. Fixtures, pipes, outlets, holdfasts of doors and windows and other embedded items shall be built into the masonry in cement mortar as required.

2.4. Joints

2.4.1. Bricks shall be laid so that all joints are completely filled with mortar. The thickness of joints shall not exceed 12 mm. Joints on exposed faces shall be raked out while the mortar is still green to provide a key for plastering or pointing.

2.4.2. The exposed faces of masonry shall be cleaned daily and all mortar droppings shall be removed.

2.5. Curing

2.5.1. Fresh masonry shall be protected from rain and adverse weather conditions. The masonry shall be kept continuously moist on all faces for a period of not less than seven days. The top of the masonry shall be thoroughly wetted at the close of each day's work.

2.6. Preparation of Foundation Bed

2.6.1. Where masonry is to be laid directly on the excavated bed, the bed shall be properly leveled, cleaned of loose materials and wetted before commencement of masonry work.

2.6.2. Where masonry is to be laid on concrete footing, the concrete surface shall be cleaned and moistened before laying masonry.

2.6.3. The contractor shall obtain approval of the Engineer-in-Charge for the foundation bed before starting foundation masonry.

2.6.4. Where pucca flooring is to be provided flush with the top of plinth, the inside plinth offset shall be kept lower than the outside plinth top by the thickness of the flooring.

3.0. Mode of Measurements and Payment

3.1. Brick masonry shall be measured in cubic meters for completed work in foundations and plinths. Measurements shall be limited to the dimensions shown on the drawings or as directed. Battered, tapered and curved portions shall be measured net.

3.2. No deduction shall be made from the quantity of brickwork, nor shall any extra payment be made, for the following:

(a) Ends of joists, beams, posts, girders, purlins, trusses, corbels and similar members where the cross-sectional area does not exceed 500 sq.cm.

(b) Openings not exceeding 1000 sq.cm.

(c) Wall plates, bed plates, bearings of slabs, chajjas and similar members not exceeding 10 cm in thickness and not extending through the full thickness of the wall.

(d) Drainage holes, recesses and pockets for embedding holdfasts and cement concrete blocks.

(e) Iron fixtures, pipes up to 300 mm diameter, holdfasts, door and window frames and concealed wiring conduits.

(f) Chases not exceeding 350 sq.cm in cross-sectional area.

3.3. Apertures for fireplaces shall neither be deducted from masonry measurements nor paid for separately.

3.4. The rate shall include the cost of all materials, labour, tools, plants, scaffolding, curing and all incidental charges required for completion of the work.

3.5. The rate shall be for a unit of one cubic meter.

Item No. 60

Providing form work of ordinary timber planking so as to give a rough finish including centering, strutting and propping etc., height of propping and centering below supporting floor to ceiling not exceeding 4 m and removal of the same for in-situ reinforced concrete and plain concrete work in foundations, footings, bases of columns and mass concrete.

1.0 Materials

1.1. The shuttering provided shall be of ordinary timber planking and shall conform to M-26.

1.2. The dimensions of scantlings and battens shall conform to the approved design. The strength of timber used shall not be less than that assumed in the design.

2.0 Workmanship

2.1 Form Work

2.1.1. Form work shall conform to the shapes, lines, levels and dimensions shown on the drawings and shall be sufficiently rigid to withstand all loads during placing and compaction of concrete.

2.1.2. Adequate precautions shall be taken to prevent settlement, distortion or displacement of form work during and after concreting.

2.1.3. Shuttering, centering, bracing, scaffolding and supports shall be designed and erected to ensure stability and safety throughout the concreting operations.

2.2 Cleaning and Treatment of Forms

2.2.1. All rubbish, shavings, saw dust and loose materials shall be removed from the interior of forms before placing concrete.

2.2.2. Surfaces coming in contact with concrete shall be thoroughly cleaned and wetted or treated with an approved releasing agent.

2.2.3. The contact surfaces shall be coated with soap solution prepared by dissolving yellow soap in water to a paint-like consistency or alternatively coated with raw linseed oil.

2.2.4. Care shall be taken to prevent the release agent from coming into contact with reinforcement bars or construction joints.

2.3 Stripping Time

2.3.1. Under normal conditions and when ordinary Portland cement is used, form work may be removed after the following minimum periods:

(a) Sides of walls, columns and vertical faces of beams – **24 to 48 hours**

(b) Beam soffits with props left under – **7 days**

(c) Removal of props to slabs:

- Spanning up to 4.5 m – **7 days**
- Spanning over 4.5 m – **14 days**

(d) Removal of props to beams and arches:

- Spanning up to 6 m – **14 days**
- Spanning over 6 m – **21 days**

2.4 Removal of Form Work

2.4.1. Form work shall be removed carefully without shock, vibration or damage to the concrete surface.

2.4.2. Before removal of soffit forms and props, the concrete shall be inspected to ensure that it has attained sufficient strength.

2.5 Centering

2.5.1. Centering shall be approved by the Engineer-in-Charge and shall be sufficiently strong to carry all dead, live and impact loads safely.

2.5.2. Props shall be placed on firm foundations capable of supporting the imposed loads without settlement.

2.5.3. Approval of centering and form work by the Engineer-in-Charge shall not relieve the contractor of responsibility for adequacy, strength and safety. Any failure shall be entirely at the contractor's risk and cost.

2.6 Scaffolding

2.6.1. All scaffolding, hoisting arrangements and ladders required for execution of the work shall be provided, maintained and removed by the contractor at his own expense.

2.6.2. Scaffolding and access arrangements shall be strong enough to withstand all expected loads and shall provide safe access and inspection facilities.

2.6.3. The rate shall be applicable for all working conditions up to a height of 4 m and shall include:

- (a) Splayed edges, notching, overlaps, battens, centering, shuttering, propping, bolting, wedging, easing, striking and removal.
- (b) Fillets for chamfered edges or splayed external angles not exceeding 20 mm width.
- (c) Temporary openings required for placing concrete and removal of debris.
- (d) Application of oil or release agents to prevent adhesion of concrete.
- (e) Raking, circular cutting and similar operations.

2.7 Re-use

2.7.1. Before reuse, all forms shall be inspected by the Engineer-in-Charge and repaired where necessary.

2.7.2. Forms shall be cleaned thoroughly and retreated with approved release agents before reuse.

3.0 Mode of Measurements and Payment

- 3.1.** Form work shall be measured in square meters of the actual surface in contact with concrete.
- 3.2.** For inclined members, curved profiles and upper surfaces, the area of the underside surface shall be measured for payment.
- 3.3.** Form work to secondary beams shall be measured up to the sides of main beams. No deduction shall be made in the form work of main beams at intersections, nor for beam-column intersections.
- 3.4.** The rate shall include all materials, labour, centering, shuttering, scaffolding, treatment, erection, removal and all incidental charges necessary for completion of the work.
- 3.5.** The rate shall be for a unit of one square meter.

Item No. 61

Providing TMT Bar FE 500D reinforcement for R.C.C. work including bending, binding and placing in position complete upto floor two level

1.0 Materials

- 1.1** Reinforcement steel shall be Thermo Mechanically Treated (TMT) bars of Fe 500D grade conforming to relevant IS specifications and of approved make.
- 1.2** Steel bars shall be free from loose rust, oil, grease, paint, dust and any other deleterious materials.
- 1.3** Binding wire shall be annealed steel wire of approved quality suitable for tying reinforcement securely.
- 1.4** Cover blocks, chairs and spacers shall be of approved material to maintain proper cover as per structural drawings.

2.0 Workmanship

2.1 General

- 2.1.1** The work shall consist of cutting, bending, placing, tying and fixing reinforcement steel in position for RCC works as per approved drawings.
- 2.1.2** Reinforcement shall be fabricated strictly in accordance with structural drawings and bar bending schedule (BBS).

2.2 Cutting and Bending

- 2.2.1** Bars shall be cut and bent accurately to required shapes and dimensions without damaging the steel.
- 2.2.2** Bending shall be done using proper bending tools to avoid cracks or weakening of bars.

2.3 Placing and Fixing

- 2.3.1** Reinforcement shall be placed in correct position, line, level and spacing as shown in drawings.
- 2.3.2** Bars shall be securely tied at all intersections with annealed binding wire to maintain rigidity during concreting.

2.3.3 Adequate cover shall be maintained using cover blocks, chairs and spacers as required.

2.4 Lap, Anchorage and Supports

2.4.1 Laps, hooks, bends and anchorage shall be provided as per structural drawings and relevant IS codes.

2.4.2 Proper support shall be provided to prevent displacement during concreting operations.

2.5 Limit of Work

2.5.1 The reinforcement work shall be carried out up to floor two level only, unless otherwise specified.

3.0 Mode of Measurement and Payment

3.1 Reinforcement steel shall be measured in kilograms (kg) of actual steel placed in position, as per approved drawings.

3.2 The rate shall include cost of steel, cutting, bending, binding wire, placing in position, laps, hooks, chairs, spacers and all wastage.

3.3 The rate shall also include labour, tools, equipment, scaffolding (up to floor two level), transportation and all incidental charges.

3.4 No extra payment shall be made for laps, bends, hooks or wastage.

3.5 The rate shall be for a unit of One Kilogram (kg).

Item No. 62

20 mm Thick Sand Face Cement Plaster on Walls up to Height of 10 m Above Ground Level Consisting of 12 mm Thick Backing Coat in C.M. 1:3 (1 Cement : 3 Sand) and 8 mm Thick Finishing Coat in C.M. 1:1 (1 Cement : 1 Sand), Complete.

1.0 Materials

1.1 Water shall conform to M-1. Cement mortar shall conform to M-11.

2.0 Workmanship

2.1 Backing Coat

2.1.1 The plaster work shall be carried out in two coats. The backing coat (base coat) shall be 12 mm thick in cement mortar 1:3 (1 cement : 3 sand). The relevant specifications of Item No. 17.58(I) shall be followed except that the thickness of the backing coat shall be maintained at an average of 12 mm.

2.1.2 Before the first coat hardens, its surface shall be roughened by beating with the edges of wooden floats and by making close indentations to provide a proper key for the finishing coat.

2.1.3 The finishing coat shall be applied only after the backing coat has been allowed to set for a period of 3 to 5 days depending upon weather conditions. The backing coat shall be kept continuously moist during this period and shall not be allowed to dry.

2.2 Finishing Coat

2.2.1 The finishing coat shall be 8 mm thick in cement mortar 1:1 (1 cement : 1 sand).

2.2.2 The coat shall be finished to produce an approved sand face texture by brushing the surface while the mortar is still green.

2.2.3 A sample panel of sand face finish shall be prepared and approved by the Engineer-in-Charge before commencement of the work.

2.2.4 The entire work shall be executed uniformly to match the approved sample in texture, colour and finish.

2.3 Curing

2.3.1 Curing shall commence within 24 hours after completion of plastering.

2.3.2 The plastered surface shall be kept continuously wet for a period of not less than 7 days.

2.3.3 During the curing period, the plastered surface shall be protected from damage, stains and adverse weather conditions.

3.0 Mode of Measurement and Payment

3.1 The relevant specifications of Item No. 17.58 shall be followed except that sand face plaster on external walls up to a height of 10 m above ground level shall be measured under this item.

3.2 Measurement shall be made in square meters for the actual area plastered and completed as specified.

3.3 The rate shall include the cost of all materials, labour, scaffolding, surface preparation, mixing, application, finishing, curing and all incidental charges required for satisfactory completion of the work.

3.4 The rate shall be for a unit of **One Square Meter (Sq. M.)**.

Item No. 63

Supply and fixing of Natural Stone Wall Cladding panels, size 150mm x 600mm, in 'White Tiger' pattern, made from natural stone with a textured finish and a blend of white and grey tones. The cladding shall be suitable for both interior and exterior applications, fixed over a prepared surface with approved adhesive or mechanical fixing system as per manufacturer's specifications. The stone panels shall be durable, weather-resistant, and aesthetically consistent, enhancing the visual appeal of feature walls, facades, columns, and fireplaces. All workmanship shall be neat and joints aligned properly to ensure a seamless appearance. Installation to be completed in accordance with architect's direction and as per site conditions.

1.0 Materials

1.1 Natural stone cladding panels shall be of approved "White Tiger" pattern with size 150 mm x 600 mm, having uniform thickness, texture and colour variation as per approved sample.

1.2 The stone shall be durable, sound, weather-resistant, non-porous (as applicable), and suitable for interior and exterior cladding applications.

1.3 Adhesive shall be of approved polymer-modified type suitable for natural stone fixing, conforming to manufacturer's recommendations.

1.4 Mechanical fixing accessories (if required) such as anchors, clamps, screws, channels, etc. shall be of corrosion-resistant material suitable for exterior use.

1.5 Grout/joint filler shall be of approved quality, colour-matched and suitable for stone cladding work.

2.0 Workmanship

2.1 General

2.1.1 The work shall include supply, transportation, cutting, fixing and installation of stone cladding panels at all heights and locations as directed.

2.1.2 Installation shall be carried out strictly as per approved shop drawings, manufacturer's specifications and architectural guidelines.

2.2 Surface Preparation

2.2.1 The substrate shall be cleaned, levelled, and made free from dust, oil, loose particles and any other foreign material.

2.2.2 Surface shall be properly prepared to ensure strong adhesion or mechanical fixing as applicable.

2.3 Fixing of Stone Panels

2.3.1 Stone panels shall be fixed using approved adhesive or mechanical fixing system ensuring proper bonding and stability.

2.3.2 Panels shall be aligned properly to maintain uniform horizontal and vertical joints.

2.3.3 Care shall be taken to avoid breakage, chipping or surface damage during handling and fixing.

2.4 Jointing and Finishing

2.4.1 Joints shall be uniform, properly aligned and finished with approved grout or joint filler.

2.4.2 Excess adhesive or grout shall be cleaned immediately to maintain clean surface finish.

2.4.3 Finished surface shall be free from stains, uneven joints, lippage or defects.

2.5 Protection

2.5.1 Installed stone cladding shall be properly protected from damage, staining or impact during and after installation.

2.5.2 Any damaged or defective panels shall be replaced by the contractor at his own cost.

3.0 Mode of Measurement and Payment

3.1 Measurement shall be taken in square metres (m²) of actual cladded surface area completed and accepted.

3.2 The rate shall include cost of natural stone panels, adhesive/mechanical fixing system, cutting, wastage, installation, jointing, cleaning and finishing.

3.3 The rate shall also include labour, tools, scaffolding, transportation, handling and all incidental charges required for complete execution.

3.4 No extra payment shall be made for wastage, cutting, corners, edges, or minor adjustments.

3.5 The rate shall be for a unit of One Square Metre (m²).

Item No. 64

Providing and laying polished Kota stone slab flooring over 20mm (Average) thick base of cement mortar 1:6 (1- cement : 6-coarse sand) or L.M. 1.1.5 (1-Lime putty :1.5 - coarse sand) laid over and jointed with grey cement slurry mixed with pigment to match the shade of slab including rubbing and polishing etc. complete. (A) 25mm thick

1.0 Materials

1.1 Kota stone slabs shall be of approved quality, uniform texture, sound, free from cracks, veins, flaws and other defects, and of specified 25 mm thickness.

1.2 Cement shall be of approved brand and conforming to relevant IS specifications.

1.3 Fine sand/coarse sand shall be clean, well graded and free from impurities.

1.4 Lime putty (where used) shall be well slaked, matured and of approved quality.

1.5 Pigments used for jointing slurry shall be of approved colour and quality suitable for flooring work.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of providing, laying, fixing and polishing Kota stone slabs over prepared mortar bed including all operations required for complete flooring.

2.1.2 The flooring shall be executed in true line, level, slope and pattern as per drawings.

2.2 Base Preparation

2.2.1 The base shall be prepared by laying 20 mm (average) thick cement mortar 1:6 or lime mortar 1:1.5 as specified.

2.2.2 The mortar bed shall be properly levelled and compacted to receive stone slabs.

2.3 Laying of Slabs

2.3.1 Kota stone slabs shall be laid over the prepared mortar bed and properly pressed to achieve full bedding.

2.3.2 Slabs shall be laid in required pattern with uniform joints and proper alignment.

2.3.3 Care shall be taken to ensure level surface and proper slope for drainage wherever required.

2.4 Jointing

2.4.1 Joints shall be filled with grey cement slurry mixed with approved pigment to match the shade of slabs.

2.4.2 Joints shall be neat, uniform and free from gaps or excess material.

2.5 Rubbing and Polishing

2.5.1 After laying, the surface shall be properly cured and then machine/hand rubbed to obtain smooth finish.

2.5.2 Final polishing shall be carried out to achieve uniform, smooth and glossy surface as approved.

2.5.3 The finished surface shall be free from scratches, undulations, stains and other defects.

2.6 Curing and Protection

2.6.1 The flooring shall be properly cured for adequate period to achieve full strength.

2.6.2 Finished surface shall be protected from damage during construction activities.

3.0 Mode of Measurement and Payment

3.1 The flooring shall be measured in square metres (m²) of finished surface area laid and accepted.

3.2 The rate shall include cost of Kota stone slabs, base mortar, laying, jointing, rubbing, polishing, curing and all incidental works.

3.3 The rate shall also include labour, tools, equipment, scaffolding (if any), transportation and wastage.

3.4 No extra payment shall be made for cutting, edges, corners or minor adjustments.

3.5 The rate shall be for a unit of One Square Metre (m²).

Item No. 65

Providing Loam or clay soil of approved quantity on site

1.0 Materials

1.1 The loam or clay soil shall be of approved quality, fertile and suitable for plantation, turfing and landscaping purposes.

1.2 The soil shall be free from stones, brick bats, rubbish, weeds, roots, organic matter, harmful salts and any other deleterious materials.

1.3 The soil shall have good texture, moisture retention and drainage properties suitable for plant growth.

1.4 The soil shall be obtained from approved source and shall be subject to approval of the Engineer-in-Charge prior to use.

2.0 Workmanship

2.1 General

2.1.1 The work shall consist of providing, transporting, unloading and stacking of loam or clay soil at site in required quantity.

2.1.2 The soil shall be handled carefully to avoid contamination, segregation or loss of fine particles.

2.2 Transportation and Stacking

2.2.1 The soil shall be transported from approved source to site in suitable vehicles.

2.2.2 Loading and unloading shall be done carefully to maintain quality and prevent mixing with unsuitable materials.

2.2.3 The soil shall be stacked neatly at designated locations without obstructing site activities.

2.3 Quality Control

2.3.1 The soil shall be subject to inspection and approval by the Engineer-in-Charge before acceptance.

2.3.2 Any rejected material shall be removed from site and replaced by the contractor at his own cost.

3.0 Mode of Measurement and Payment

3.1 The loam or clay soil shall be measured in cubic metres (m^3) of material supplied, stacked and accepted at site.

3.2 The rate shall include cost of soil, excavation at source, loading, transportation, unloading, stacking and all handling charges.

3.3 The rate shall include labour, tools, equipment, leads and lifts and all incidental charges required for completion.

3.4 No extra payment shall be made for wastage, segregation or site handling.

3.5 The rate shall be for a unit of One Cubic Metre (m^3).