

GOVERNMENT OF GUJARAT
ROADS & BUILDING DEPARTMENT



SPECIFICATION

Name of Work:

Construction of Various Category Quarters in Ahmedabad City (Addition, Alteration, Upgradation and Modernization of Campus, Landscaping and Beautification of Gardens and other Beautification work in Campus of Govt. Bungalow No. 4 to 30 at Dafnala, Shahibaug, Ahmedabad) (3rd attempt)

Deputy Executive Engineer
Shahibaug (R&B) Sub Division
Ahmedabad

Executive Engineer
Ahmedabad City (R&B) Division
Ahmedabad



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VOLUME 5 : TECHNICAL SPECIFICATIONS

Item No. 03

Removing and scraping of old deteriorated plaster of any thickness from wall / R.C.C member including stacking of serviceable material and disposal of unserviceable from site of work with all lead and lift

1. Materials

The primary materials involved in this process are the serviceable and unserviceable components of the removed plaster. The removed material is categorized for proper disposal and reuse.

- **Serviceable Material:** This refers to any components of the removed plaster, such as salvaged bricks or decorative elements that can be reused in other construction work. These materials must be carefully stacked and stored on-site to prevent damage.
- **Unserviceable Material:** This is the bulk of the removed plaster, including dust, broken pieces, and other debris that cannot be reused. This material must be collected and disposed of off-site at an approved disposal facility.

2. Workmanship

The execution of the work must follow a specific sequence to ensure safety, efficiency, and a clean final surface.

- **Preparation:** Before starting, the work area must be cordoned off to ensure safety. All surrounding surfaces, such as floors, doors, and windows, must be covered with protective sheeting to prevent damage and contamination.
- **Scraping and Chipping:** The old plaster is removed using tools like chisels, hammers, and scrapers. The removal process should be done carefully to avoid damaging the underlying wall or RCC member. The depth of removal should be to the original masonry or concrete surface.
- **Cleaning:** After the plaster is removed, the exposed surface must be thoroughly cleaned. All loose particles, dust, and debris should be brushed off. The surface should then be hosed down with water to remove any remaining fine dust, ensuring it's ready for a new application of plaster or a different finish.
- **Disposal:** Unserviceable material must be collected promptly and taken to a designated disposal area. Serviceable material must be carefully stacked and stored on-site as instructed. The entire work area should be cleaned of all debris at the end of each workday.

3. MODE OF MEASUREMENT & PAYMENT

- **Unit of Measurement:** The work is measured in **square meters (m²)** of the surface area from which the plaster has been removed.

Item No. 09

Plinth Treatment: Carrying out plinth treatment to post construction / existing structure by spraying chemical solution for termite control treatment including labour and material consistent with I.S.I specification. Using Chlordene and Chlorpyrifos 20 EC. As Per 6131 _part-II Concentration Weight one percent is recommended i.e one litre 20 EC chemical emulsion with 19 liter give 1 %concentration inclusive of one litre chemical emulsion application at the rate of 5 Litre chemical / Sqm of surface is recommended as per I.S

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Chemical for Anti-Termite Treatment

Anti-termite chemical shall be a **approved emulsifiable concentrate** conforming to **IS:6313 (Part-II) – Code of Practice for Anti-Termite Measures in Buildings**.

The chemical shall be **Chlorpyrifos 20% EC or equivalent approved termiticide** as permitted by statutory authorities specifications.

The chemical shall be supplied in original sealed containers bearing manufacturer's name, batch number, date of manufacture and expiry.

Note: Concentration by weight shall be **1% emulsion**, prepared by mixing **1 litre of 20% EC chemical with 19 litres of water**, unless otherwise directed by the Engineer-in-Charge, strictly as per IS:6313 (Part-II).

2. WORKMANSHIP

1. Preparation of Surface

- The area around the plinth shall be cleared of all debris, loose earth, vegetation, rubbish, wooden pieces, or any other organic matter.
- Cracks, joints, honeycombs, and service entry points in plinth walls, floors, and surrounding areas shall be identified prior to treatment.

2. Preparation of Chemical Emulsion

- The emulsion shall be prepared on site using clean water.
- **1 litre of 20 EC chemical shall be mixed with 19 litres of water** to obtain **1% concentration**, ensuring uniform mixing.
- Mixing shall be done in clean containers using proper safety precautions.

3. Method of Application

- The chemical emulsion shall be applied by **spraying or pressure injection** using hand-operated or motorized sprayers fitted with appropriate nozzles.
- Treatment shall be carried out along the external perimeter of the building, plinth walls, expansion joints, and at all points of contact between soil and structure.
- For existing structures, treatment shall also be applied through drilled holes at suitable intervals, where required, to ensure effective penetration.

4. Rate of Application

- The emulsion shall be applied uniformly at the rate of **5 litres per square metre of surface area**, or as specified in **IS:6313 (Part-II)**.

5. Precautions and Safety

- The operator shall use protective clothing, gloves, masks, and goggles during handling and application.
- Care shall be taken to avoid contamination of drinking water sources, food materials, and nearby vegetation.
- Treated areas shall not be disturbed for at least **24 hours** after application.

6. Completion

- After completion of treatment, the area shall be left undisturbed and shall be handed over in clean condition.
- Any damage to plaster, flooring, or finishes during treatment shall be made good to the satisfaction of the Engineer-in-Charge at no extra cost.

3. MODE OF MEASUREMENT & PAYMENT

1. Unit of Measurement

- Plinth treatment shall be measured in **square metres (Sqm)** of surface area actually treated.

Item No. 18

Tre-mix : Box cutting the road 300mm surface to proper slope and camber for making a base with Providing, laying, spreading and compacting Sand filling 100 mm thick including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tones to proper grade and camber, watering and compacting to the required density. below 150mm thick 1:2:4 (1- Cement : 2- Coarse sand : 4- graded stone aggregates 20 mm nominal size)cement concrete and 200 MM Thick Ready Mixed M-350 grade concrete for reinforced cement concrete work , using cement content as per approved Design Mix manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10 kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying, including the cost of centering shuttering finishing and cost of admixtures in recommended proportions as per IS: 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in - charge. Without Fly Ash including (10 Dia 200c/c) FE 500D reinforcement with bending, binding and placing in position complete.

1. MATERIALS

Water

Water: Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Cement

Cement: Shall conform **M.3 Page No-9** in General Technical Specification Booklet.

Sand (Fine Aggregate / Coarse Sand)

Sand : Shall conform **M.6 Page No-10** in General Technical Specification Booklet.

Stone Grit / Coarse Aggregate (20 mm nominal size)

Stone Grit : Shall conform **M.8 Page No-10** in General Technical Specification Booklet.

Ready Mixed Concrete (RMC)

Ready Mixed Concrete shall be **M-350 grade**, produced in a **fully automatic batching plant**, conforming to **IS:4926, IS:456**, and specifications, using approved **Design Mix** without fly ash.

Admixtures

Chemical admixtures: Shall conform to **IS:9103**, compatible with cement and concrete, and used only with approval of the Engineer-in-Charge.

Reinforcement Steel

High Yield Strength Deformed Steel Bars (Fe-500D) : Shall conform **M.19 Page No-13** in General Technical Specification Booklet and IS:1786.

2. WORKMANSHIP

(a) Box Cutting of Road

- Existing road surface shall be box-cut to a depth of **300 mm** or as directed.
- The cutting shall be done true to line, level, slope, and camber.
- Loose material shall be removed and disposed of as directed.

(b) Sand Filling – 100 mm Thick

- Approved sand shall be laid in **100 mm compacted thickness**.

- Sand shall be spread uniformly, hand packed, watered, and compacted using **8–10 tonne vibratory roller**.
- Finished surface shall conform to required **grade and camber**.

(c) Plain Cement Concrete (PCC) – 150 mm Thick

- **1:2:4 cement concrete** (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) shall be laid below RCC.
- Mixing shall be done mechanically.
- Concrete shall be laid, compacted using mechanical vibrators, and finished properly.
- Curing shall be done for a minimum of **7 days**.

(d) Reinforced Cement Concrete (RCC) – 200 mm Thick (M-350 Grade)

- **200 mm thick Ready Mixed Concrete (M-350 grade)** shall be laid over PCC.
- RMC shall be manufactured in a fully automatic batching plant as per approved **Design Mix**, without fly ash.

(e) Pumping, Laying & Finishing

- RMC shall be placed using **concrete pumps** directly from transit mixer.
- Concrete shall be vibrated with needle vibrators to ensure proper compaction.
- Surface shall be finished to required **camber and smoothness** suitable for tre-mix pavement.

(f) Reinforcement

- **Fe-500D reinforcement bars of 10 mm diameter @ 200 mm c/c** shall be provided.
- Bars shall be cut, bent, bound with binding wire, and placed in position as per drawings.
- Adequate cover blocks shall be provided.

(g) Shuttering / Centering

- Centering and shuttering shall be true to line and level, sufficiently rigid, and leak-proof.
- Removal shall be done carefully without damaging concrete.

(h) Curing & groove cutting

- Providing and applying **Concrete Road Curing Compound @ 0.33 litre per sqm**.
- Curing compound to be of approved make and applied as per manufacturer's instructions.
- Providing and fixing expansion joints with approved joint filler material.
- Concrete road joint cutting / groove cutting using mechanical cutter at required spacing, depth, and alignment.
- Filling joints with approved joint filler/sealant

3. MODE OF MEASUREMENT & PAYMENT

- The work shall be measured in **Square Metres (Sqm)** as specified in the BOQ.

Item No. 22

Fiberglass Mesh : Providing and Fixing Fiberglass Mesh with alkali resistant coating having mass per unit area 145 gram/M2, Mesh size 3.9 x 4.0 mm +_ 10% with all labour and accessories of fixing etc. complete as per instruction given by engineer in charge/Architect.

1. MATERIALS

Fiberglass Mesh

Fiberglass Mesh shall be **alkali resistant**, woven glass fiber mesh with **special polymer coating**, having:

- **Mass per unit area:** 145 g/m²
- **Mesh size:** 3.9 mm × 4.0 mm (±10%)

The mesh shall conform to relevant **IS standards / international standards** for alkali resistance and durability and shall be approved by the Engineer-in-Charge prior to use.

Accessories

Accessories such as fixing clips, fasteners, adhesive mortar, or anchoring materials shall be of approved quality, compatible with the substrate, and as recommended by the manufacturer and approved by the Engineer-in-Charge.

2. WORKMANSHIP

1. Surface Preparation

- The surface shall be clean, sound, dry, and free from dust, grease, loose particles, and any foreign matter.
- Uneven surfaces shall be leveled prior to fixing of the mesh.

2. Fixing of Fiberglass Mesh

- Fiberglass mesh shall be cut to required size and fixed strictly as per approved drawings, manufacturer's recommendations, and directions of the Engineer-in-Charge / Architect.
- Mesh shall be laid without wrinkles, folds, or overlaps beyond specified limits.
- Joints shall be overlapped by not less than **100 mm** unless otherwise directed.

3. Embedding / Anchoring

- Mesh shall be embedded or fixed using approved bonding material or mechanical fasteners as required for the application.
- Proper tension shall be maintained to avoid sagging or displacement.

4. Completion

- Finished work shall be true to line, level, and plane.
- Any damaged or loose mesh shall be replaced at no extra cost.
- The work shall be protected from damage until subsequent finishes are applied.

3. MODE OF MEASUREMENT & PAYMENT

1. Unit of Measurement

- The work shall be measured in **Square Metres (Sqm)** of surface area actually covered with fiberglass mesh.

Item No. 25

Applying Two coats of putty & two coats of primer of approved brand and manufacture on new wall surface to give an even shade including thoroughly brushing the surface free from mortar dropping and other foreign matter and sand papered smooth. item shall be used as per instruction of Architect/EIC.

Materials

- **Wall Putty:** Use a white cement-based polymer putty of an approved brand and manufacturer. The putty should have good adhesion, be water-resistant, and provide a smooth, durable base for the paint. It must be free from lumps and foreign matter.
- **Primer:** Use a high-quality water-based or oil-based primer of an approved brand and manufacturer, specifically designed for new interior or exterior wall surfaces. The primer must be suitable for the final paint application and provide good sealing properties.
- **Sandpaper:** Use different grits of sandpaper, including a coarser grit for initial smoothing and a finer grit for the final finish.
- **Tools:** Brushes, rollers, scrapers, and putty knives should be clean and in good condition.

Workmanship

- Surface Preparation:
 1. Ensure the new wall surface is completely dry and cured.
 2. Thoroughly brush the surface to remove all mortar droppings, dust, and other foreign matter.
 3. Inspect the surface for any undulations, cracks, or minor imperfections.
 4. Use sandpaper to smooth the surface, ensuring it is free from any rough spots.
 5. Wipe the surface clean with a dry cloth to remove all dust.
- Putty Application:
 1. First Coat of Putty: Mix the wall putty with water according to the manufacturer's instructions to a smooth, lump-free consistency. Apply the first coat evenly across the entire wall surface using a putty knife or trowel. Ensure all pores and minor cracks are filled. Let it dry completely as per the manufacturer's guidelines, typically 4-6 hours.
 2. Sanding: Once the first coat is dry, lightly sand the surface with fine-grit sandpaper to remove any marks or unevenness. Remove all dust with a clean, dry cloth.
 3. Second Coat of Putty: Apply the second coat of putty to achieve a uniform, smooth, and blemish-free surface. This coat will fill any remaining imperfections and provide the final finish for the primer. Allow this coat to dry completely, typically for at least 12 hours.
 4. Final Sanding: After the second coat is dry, sand the surface with very fine sandpaper to a perfectly smooth finish. The surface should be free of any lines or marks.
 5. Wipe the surface clean to remove all dust before applying the primer.
- Primer Application:
 1. First Coat of Primer: Dilute the primer as per the manufacturer's instructions. Apply the first coat of primer evenly using a brush or roller. Ensure the entire wall surface is covered, providing a uniform shade and sealing the putty. Allow the primer to dry completely, typically 6-8 hours.
 2. Second Coat of Primer: Once the first coat is dry, apply the second coat of primer. This second coat ensures complete opacity and provides an even, non-absorbent base for the final paint. The primer should give a consistent, even shade across the entire surface.
 3. After the second coat is dry, the surface is ready for the final paint application.

MODE OF MEASUREMENT & PAYMENT

- The work of applying two coats of putty and two coats of primer will be measured in **square meters (Sqm)** based on the net finished area of the wall surface.

Item No. 26

Apex Ultima weatherproof exterior paint: Providing and applying Apex Ultima weatherproof exterior emulsion paint on external wall surfaces in two coats, over properly prepared surfaces including thorough cleaning, brushing, and removal of all dust, dirt, grease, and loose powdered materials, to achieve a uniform shade and durable finish, complete as per manufacturer's specifications and directions.

1. MATERIALS

Water

Water: Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Paints

Paints: Shall conform **M.44 Page No-21** in General Technical Specification Booklet.

2. WORKMANSHIP

1. Surface Preparation

- External wall surfaces shall be thoroughly cleaned by brushing, scraping, or washing to remove all dust, dirt, grease, efflorescence, loose or flaking material, algae, and fungal growth.
 - Cracks, holes, and surface imperfections shall be repaired using approved putty or filler and allowed to dry properly.
 - Previously painted surfaces, if any, shall be rubbed down and made smooth.
- 2. Application of Paint**
- Apex Ultima Weatherproof Exterior Emulsion Paint shall be applied in **two coats** over the prepared surface.
 - Paint shall be applied by brush, roller, or spray as approved, ensuring even coverage and uniform shade.
 - The first coat shall be allowed to dry completely before application of the second coat, as per manufacturer's recommended drying time.
- 3. Dilution and Coverage**
- Dilution, if required, shall be done strictly as per manufacturer's instructions using clean potable water.
 - Coverage shall be as per manufacturer's specifications to achieve the desired durability and finish.
- 4. Finish and Protection**
- Finished surface shall be smooth, uniform in colour, and free from brush marks, patches, streaks, or sagging.
 - Freshly painted surfaces shall be protected from rain, dust, and direct sunlight until fully dry.

3. MODE OF MEASUREMENT & PAYMENT

1. Unit of Measurement

- The work shall be measured in **Square Metres (Sqm)** of painted surface.

Item No. 27

Providing and applying Luxture Texture finish on wall surfaces using approved textured materials such as acrylic-based compounds or equivalent, including surface preparation, base coat, texture application with required tools and techniques, scaffoldings & support system and final finish as per approved sample. Work to be completed as per manufacturer's specifications and direction of Engineer-in-Charge.

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Paints / Textured Coating Materials

Paints / Textured materials : Shall conform **M.44 Page No-21** in General Technical Specification Booklet.

2. WORKMANSHIP

1. Surface Preparation

- Wall surfaces shall be sound, dry, and free from dust, dirt, grease, oil, efflorescence, loose plaster, or flaking paint.
- Cracks, holes, and surface irregularities shall be repaired with approved filler/putty and allowed to dry.
- Surface shall be lightly rubbed and cleaned to ensure proper bonding.

2. Base Coat / Primer

- A suitable base coat or primer, compatible with the texture finish material, shall be applied uniformly as recommended by the manufacturer.
- Adequate drying time shall be allowed before texture application.

3. Application of Texture Finish

- Luxure texture finish shall be applied using **trowel, spatula, roller, spray, or other approved tools** to achieve the specified texture pattern.
- Texture pattern and thickness shall match the **approved sample panel**.
- Application shall be uniform, without cracks, patches, sagging, or visible joints.

4. Scaffolding and Safety

- Necessary **scaffolding, staging, and support systems** shall be provided, erected, and removed safely by the contractor.
- All safety measures shall be followed during execution.

5. Finishing and Protection

- Finished surface shall be even, aesthetically pleasing, and true to line and level.
- The surface shall be protected from rain, dust, and mechanical damage until fully cured.

3. MODE OF MEASUREMENT & PAYMENT

1. Unit of Measurement

- The work shall be measured in **Square Metres (Sqm)** of finished surface.

Item No. 28

Waterproofing treatment on Terrace: Providing and applying Fibre reinforced Elastomeric liquid Water proofing membrane with resilient Acrylic polymers having Sun Reflectivity Index (SRI) of 105 on Top of concrete roof in top of concrete in three coats @ 10.76 litre/10 sq.m. One coat of self-priming of Elastomeric water proofing liquid (delution with water in the ratio of 3:1) and two coats of undiluted elastomeric waterproofing liquid (dry film thickness of complete application/system not less than 500 microns). The operation shall be carried out after scraping and properly cleaning the surface to remove loose particles with wire brushes , complete in all respect as per the direction of Engineer-in-charge.

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Waterproofing Material

Fibre reinforced elastomeric liquid waterproofing membrane based on **resilient acrylic polymers**, having:

- **Sun Reflectivity Index (SRI): 105**
- High elasticity, crack-bridging property, UV resistance, and weather durability

2. WORKMANSHIP

1. Surface Preparation

- The concrete roof surface shall be thoroughly scraped and cleaned using wire brushes to remove dust, dirt, laitance, loose particles, moss, oil, grease, or any other foreign matter.
- All cracks, honeycombs, and damaged portions shall be repaired with approved repair mortar and allowed to cure.
- The surface shall be sound, dry, and clean before application.

2. Primer Coat

- One coat of **self-priming elastomeric waterproofing liquid** shall be applied after dilution with clean water in the ratio of **3:1 (water : waterproofing liquid)**.
- Primer coat shall be applied uniformly using brush or roller to ensure proper adhesion.
- Sufficient drying time shall be allowed as per manufacturer's specifications.

3. Application of Elastomeric Waterproofing Membrane

- After the primer coat has dried, **two coats of undiluted fibre reinforced elastomeric waterproofing liquid** shall be applied.
 - Coats shall be applied in alternate directions to ensure uniform coverage.
 - The total consumption of waterproofing material shall be **10.76 litres per 10 square metres** for the complete system.
4. **Thickness Requirement**
- The total **dry film thickness (DFT)** of the complete waterproofing system shall be **not less than 500 microns**, uniformly achieved over the entire treated area.
5. **Curing and Protection**
- Each coat shall be allowed to dry fully before application of the subsequent coat.
 - The treated surface shall be protected from rain, dust, and traffic until fully cured.
6. **Completion**
- The finished waterproofing layer shall be seamless, continuous, and free from pinholes, cracks, blisters, or peeling.
 - The work shall be completed in all respects to the satisfaction of the Engineer-in-Charge.

3. MODE OF MEASUREMENT & PAYMENT

1. Unit of Measurement

- Waterproofing treatment shall be measured in **Square Metres (Sqm)** of terrace area actually treated.

Item No. 29

China Mosaic Flooring: Providing and laying broken chine mosaic flooring for terrace using 12 mm to 20 mm broken pieces of glazed tiles to be laid over cement mortar 1:3 top lain or slope and to be tempered to bring mortar creme out upto surface using white cement including rounding off junctions and extending them up to 15 cm along the wall, clearing with water and oxalic acid etc. as directed.

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Cement

Cement : Shall conform **M.3 Page No-9** in General Technical Specification Booklet.

White Cement

White Cement : Shall conform **M.4 Page No-9** in General Technical Specification Booklet.

Sand

Sand : Shall conform **M.6 Page No-10** in General Technical Specification Booklet.

Broken Glazed Tiles (China Mosaic)

Broken pieces of glazed ceramic tiles shall be hard, sound, durable, free from cracks and defects, and of approved quality.

Piece size shall generally range between **12 mm to 20 mm**, unless otherwise directed by the Engineer-in-Charge.

Cement Mortar

Cement Mortar : Shall conform **M.11 Page No-11** in General Technical Specification Booklet.

Mortar proportion shall be **1:3 (1 Cement : 3 Sand)**.

2. WORKMANSHIP

1. Preparation of Base

- The terrace surface shall be cleaned thoroughly to remove dust, dirt, loose particles, oil, or grease.
- Necessary slope for drainage shall be ensured prior to laying the mosaic flooring.

2. Laying of Cement Mortar Bed

- Cement mortar **1:3** shall be laid evenly over the prepared surface to the required thickness and slope.
- The mortar bed shall be compacted and leveled properly.

3. Laying of China Mosaic

- Broken pieces of glazed tiles (12 mm to 20 mm size) shall be hand-laid uniformly over the green mortar bed.
- The pieces shall be closely packed with minimum gaps and gently pressed to proper level.

4. Tamping and Finishing

- The surface shall be tamped gently to bring the cement mortar cream to the top.
- White cement slurry shall be applied, if required, to fill joints and improve finish.

5. Rounding and Skirting

- Junctions of floor and walls shall be **rounded off (gola)** neatly.
- The mosaic flooring shall be extended **up to 15 cm along the wall** as skirting, properly finished.

6. Cleaning and Polishing

- After initial setting, the surface shall be cleaned with water and **oxalic acid** to remove cement stains and bring out the glazed finish.
- Final washing shall be done with clean water.

7. Curing

- The flooring shall be cured continuously for a minimum period of **7 days**.

3. MODE OF MEASUREMENT & PAYMENT

1. Unit of Measurement

- China mosaic flooring shall be measured in **Square Metres (Sqm)**.

Item No. 30

Providing and fixing PUF Insulated continuous sandwich panels for roofs of total thickness not less than 30 mm made out from continue line method. Panel shall have 0.5 mm thick pre coated GI sheet on both side of Polyurethane foam with external face being corrugated in shape for GI and PU foam both material. The crest height of the panel shall be of 35mm minimum with 250mm c/c pitch. The Precoated sheet shall be of minimum 240 mpa steel grade conforming to IS 14246:1995 and shall have zinc coating of 120 gsm as per IS:277 , 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 micron. The PPGI Sheet shall have protective guard film of minimum 25 microns to avoid scratches while transportation. The roof panels are laid over a frame work of trusses, columns and purlins fixed using

90mm self drilling bolt with rubber washer including all types of flashings. PU Foam must be self-extinguishing, fire retardant type having minimum density of 40 Kg/Cu.mt. (+/- 2 Kgs) including 0.25mm craft paper edging, self tapping screws of required length and nos. etc complete as per structural design and direction of Engineer-in-charge.

1. MATERIALS

Galvanised / Pre-Painted Galvanised Iron Sheets (PPGI)

Galvanised / Pre-coated GI Sheets : Shall conform **M.23 Page No-14** in General Technical Specification Booklet and relevant IS Codes.

- The pre-coated GI sheet shall be of **minimum 240 MPa steel grade** conforming to **IS:14246:1995**.
- Zinc coating shall be **minimum 120 GSM** conforming to **IS:277**.

- The coating system shall consist of:
 - **5–7 microns epoxy primer** on both sides
 - **15–18 microns polyester top coat**
- The sheet shall be provided with **protective guard film of minimum 25 microns** to prevent scratches during handling and transportation.
- Thickness of GI sheet shall be **0.5 mm on both sides**.

Polyurethane Foam (PUF) Insulation

PUF shall be **self-extinguishing, fire-retardant type**, manufactured by continuous line process, having:

- **Minimum density: 40 kg/m³ (± 2 kg/m³)**
- Uniform closed-cell structure
- Good thermal insulation, moisture resistance, and durability

Craft Paper Edging

Craft paper edging of **minimum 0.25 mm thickness** shall be provided along panel edges for protection and finishing.

Fasteners and Accessories

Self-drilling / self-tapping screws, bolts, rubber washers, flashings, sealants, and accessories shall be of approved quality, corrosion resistant, and suitable for roofing applications.

2. WORKMANSHIP

1. Manufacture of Panels

- PUF insulated sandwich panels shall be manufactured by **continuous line method** to ensure uniform bonding between GI sheets and PU foam.
- The **total thickness of panel shall not be less than 30 mm**.
- External face GI sheet shall be **corrugated in shape** along with the PU foam core.

2. Panel Profile

- Crest height of the corrugation shall be **minimum 35 mm**.
- Corrugation pitch shall be **250 mm c/c**.
- Panels shall be straight, true to size, and free from warping, dents, or defects.

3. Preparation of Supporting Structure

- Panels shall be laid over **steel framework comprising trusses, columns, and purlins**, already aligned, leveled, and fixed as per structural design.
- The spacing of purlins and framing members shall conform to approved drawings.

4. Fixing of Panels

- Panels shall be placed in position with proper overlap and alignment to ensure watertightness.
- Fixing shall be done using **90 mm self-drilling bolts with EPDM rubber washers**, tightened uniformly without damaging the panels.
- Adequate number of fasteners shall be provided as per structural design and manufacturer's recommendations.

5. Flashings and Sealing

- All ridges, hips, valleys, eaves, and junctions shall be finished with **matching GI flashings** of approved thickness and profile.
- Proper sealing shall be ensured to prevent water ingress.

6. Handling and Protection

- Panels shall be handled carefully to avoid damage to protective coating and insulation.
- Protective film shall be removed only after completion of installation.

7. Completion

- The finished roof shall be watertight, structurally sound, properly aligned, and aesthetically uniform.
- All works shall be completed to the satisfaction of the Engineer-in-Charge.

3. MODE OF MEASUREMENT & PAYMENT

1. Unit of Measurement

- The PUF sandwich roofing panels shall be measured in **Square Metres (Sqm)** of roof area actually covered.

Item No. 33

"CONCRETE KERBING (half better): Providing and fixing pre-cast concrete kerbstone of gray cement based vacuumed wet press concrete block of precision finish, as per approved design and including excavation for fixing in proper line and level, filling the joint with C:M 1:3 (1 cement: 3fine sand) etc complete. Selection as per the architect and EIC.

- (a) **VYARA_HB-B_half better Vacuumed wet press** or equivalent .Placement is as per drawing for the location,shape and design and pattern. Supply of K-HB GREY SL VWP 600*450*150MM with minimum average 2.5MPa bending strength at 28 days."

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Cement

Cement : Shall conform **M.3 Page No-9** in General Technical Specification Booklet.

Sand (Fine Aggregate)

Sand : Shall conform **M.6 Page No-10** in General Technical Specification Booklet.

Cement Mortar

Cement Mortar : Shall conform **M.11 Page No-11** in General Technical Specification Booklet.

Proportion shall be **1:3 (1 Cement : 3 Fine Sand)**.

Pre-cast Concrete Kerbstone

Pre-cast concrete kerbstones shall be manufactured from **grey cement based vacuumed wet press concrete (VWP)**, machine made, of **precision finish**, uniform shape and size, free from cracks, honeycombing, or defects.

- Type: **Half Better Kerb**
- Make/Pattern: **VYARA_HB-B Half Better Vacuumed Wet Press** or approved equivalent
- Size: **600 × 450 × 150 mm**
- Minimum average **bending strength: 2.5 MPa at 28 days**
- Kerbstones shall conform to relevant **IS standards** and approved drawings.

2. WORKMANSHIP

1. Excavation and Preparation

- Excavation shall be carried out to the required depth, width, and profile to accommodate the kerbstone and bedding.
- The base shall be properly dressed, leveled, and compacted.

2. Laying and Fixing of Kerbstone

- Pre-cast concrete kerbstones shall be placed in position in **proper line, level, slope, and alignment** as per approved drawings.
- Kerbstones shall be laid true to shape and pattern indicated.

3. Jointing

- Joints between adjacent kerbstones shall be filled neatly with **cement mortar 1:3 (1 cement : 3 fine sand)**.
- Joints shall be flush, uniform, and properly finished.
- 4. **Alignment and Finish**
 - Kerbing shall be checked continuously for straightness, level, and uniformity.
 - Any damaged or defective kerbstone shall be removed and replaced at no extra cost.
- 5. **Curing and Protection**
 - Mortar joints shall be cured adequately for a minimum of **7 days**.
 - Completed kerbing shall be protected from displacement or damage until fully set.
- 6. **Selection and Approval**
 - Kerbstone selection (type, colour, and finish) shall be **as approved by the Architect and Engineer-in-Charge**.

3. MODE OF MEASUREMENT & PAYMENT

- 1. **Unit of Measurement**
 - Concrete kerbing shall be measured in **Running Metres (Rm)** along the finished length.

Item No. 34

CONCRETE KERBING (radius): Providing and fixing pre-cast concrete kerbstone of gray cement based Vacuumed wet press concrete block of precision finish of size range as per the selection from the range given to accommodate , as per approved design and including excavation for fixing in proper line and level, filling the joint with C:M 1:3 (1cement: 3fine sand) etc complete. Selection of thickness from the range given is as per the architect and EIC. Placement is as per drawing for the location, shape and design and pattern. Supply of K-HB RA 3, 4.5, 6 (EX) GREY or red or Vyara equivalent. VWP 780*300*150MM

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Cement

Cement : Shall conform **M.3 Page No-9** in General Technical Specification Booklet.

Sand (Fine Aggregate)

Sand : Shall conform **M.6 Page No-10** in General Technical Specification Booklet.

Cement Mortar

Cement Mortar : Shall conform **M.11 Page No-11** in General Technical Specification Booklet.

Proportion: **1:3 (1 Cement : 3 Fine Sand)**.

Pre-cast Concrete Kerbstone (Radius)

- Pre-cast kerbstones shall be **grey cement-based vacuumed wet press concrete (VWP)** blocks with **precision finish**, free from cracks, honeycombing, or defects.
- Type / Make: **K-HB RA 3, 4.5, 6 (EX) Grey / Red / Vyara Equivalent**.
- Size: **780 × 300 × 150 mm** (thickness to be selected as per site requirements and approval of Architect / EIC).
- The kerbstones shall conform to relevant **IS Codes** and approved drawings.
- The colour, size, and finish shall be approved by the Engineer-in-Charge prior to fixing.

2. WORKMANSHIP

1. **Excavation and Preparation**
 - Excavate the base to proper depth, width, and profile to accommodate the kerbstone.
 - Level and compact the base to ensure stability and proper alignment.
2. **Laying and Fixing of Kerbstones**
 - Pre-cast kerbstones shall be laid in **curved alignment** according to approved radius as per drawings.
 - Each kerbstone shall be placed carefully to ensure proper line, level, slope, and curvature.
 - Kerbstones shall be gently tapped into position to avoid damage.
3. **Jointing**
 - Joints between adjacent kerbstones shall be filled with **cement mortar 1:3 (1 Cement : 3 Fine Sand)**.
 - Mortar joints shall be **flush and neat**, and finished properly.
4. **Alignment and Finish**
 - Continuous check shall be made for **correct radius, level, and alignment**.
 - Any defective or damaged kerbstones shall be replaced at no extra cost.
5. **Curing and Protection**
 - Mortar joints and kerbstones shall be cured for a minimum of **7 days**.
 - Completed kerbing shall be protected from displacement, traffic, or damage until fully set.
6. **Selection and Approval**
 - Thickness, colour, and design of kerbstones shall be as approved by the **Architect / Engineer-in-Charge**.
 - Kerbstones shall follow the **pattern, shape, and location** shown in approved drawings.

3. MODE OF MEASUREMENT & PAYMENT

1. **Unit of Measurement**
 - Concrete kerbing shall be measured in **Number (Nos)** along the finished curve.

Item No. 35

DRAIN CHANNEL WITH COVER : U shape Drain channel size - 300*300 mm with High-Performance Self-Compacting Concrete (SCC) of minimum strength / M-50 cube strength with drain testing for load capacity of Min 200 kN and Heavy duty Lid (Cover) For 300 mm similar Grade of concrete as above with Hole Design as per architect's selection and as per direction of Engineer-in-charge. Make as per tender or Equivalent.

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Cement

Cement : Shall conform **M.3 Page No-9** in General Technical Specification Booklet.

Sand (Fine Aggregate)

Sand : Shall conform **M.6 Page No-10** in General Technical Specification Booklet.

Stone / Aggregate

Coarse aggregate : Shall conform **M.12 Page No-11** in General Technical Specification Booklet.

Concrete

High-Performance **Self-Compacting Concrete (SCC)** shall be used for both **drain channel and lid**, with the following properties:

- **Minimum cube strength:** M-50 at 28 days
- **Workability:** Self-compacting, high-flow, non-segregating
- **Durability:** Suitable for external exposure and heavy-duty loading
- Concrete mix design shall be approved by the Engineer-in-Charge.

Reinforcement

- Reinforcement shall conform to **Fe 500D** / as per structural design and IS:1786.
- Reinforcement shall be designed to withstand the **required load capacity**.

Lid / Cover

- Heavy-duty lid / cover shall be made from **concrete of the same grade (M-50 SCC)** as the channel.
- Hole patterns, shape, and openings shall be as per **architect's selection**.
- Lids shall be reinforced as required to safely carry a **minimum load of 200 kN**.

Additives / Admixtures

- Admixtures may be used to improve workability, setting, and durability as per IS:9103, subject to approval.

Other Materials

- Sealing compound, lifting hooks, and inserts shall be of **approved quality**.

2. WORKMANSHIP

1. Excavation and Base Preparation

- Excavate trench to correct dimensions and depth to accommodate U-shaped drain channel.
- Prepare and compact base for uniform support.

2. Formwork and Reinforcement

- Provide accurate formwork for U-shaped channel and cover.
- Place reinforcement as per approved structural design.

3. Concrete Casting

- Use **SCC M-50** concrete to cast channel and lid.
- Ensure proper compaction, finishing, and curing to achieve required strength and surface quality.

4. Lid / Cover Placement

- Lid shall be properly reinforced and designed to sit flush over channel.
- Lifting and alignment shall be done carefully to avoid misalignment or damage.

5. Testing

- After curing, drain channel and cover shall be **tested for load capacity (minimum 200 kN)** and inspected for cracks or defects.

6. Finishing

- Exposed surfaces shall be finished smooth, free from honeycombing, cracks, or defects.
- Edges and joints shall be neat and flush.

7. Approval

- Final shape, hole design, and dimensions shall be as **approved by Architect / Engineer-in-Charge**.

3. MODE OF MEASUREMENT & PAYMENT

1. Unit of Measurement

- **Drain channel: Running Metres (Rm)** along the centerline of the channel

Item No. 38

Paver Block : Providing and fixing pre-cast Rubber Dye / steel Dye inter locking concrete block 60mm thick with grade of concrete M300 pneumatic compressed/ vibrated mechanically and as per approved design Confirming to IS 15658 : 2006 including 35mm Sand layer for levelling and filling the joint with sand in proper line and level as per guidelines of IRC : SP 63-2018 etc. Complete

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Cement

Cement : Shall conform **M.3 Page No-9** in General Technical Specification Booklet.

Sand (Fine Aggregate)

Sand : Shall conform **M.6 Page No-10** in General Technical Specification Booklet.

Coarse Aggregate / Stone Grit

Stone Grit : Shall conform **M.8 Page No-9** in General Technical Specification Booklet.

Cement Mortar

Cement Mortar : Shall conform **M.11 Page No-11** in General Technical Specification Booklet.

Pre-cast Concrete Paver Blocks

- Blocks shall be **pre-cast, interlocking type**, manufactured using **Rubber Dye or Steel Dye**.
- Thickness: **60 mm**
- Grade of concrete: **M-300**
- Compaction: **Pneumatic or mechanically vibrated / compressed**
- Standards: Shall conform to **IS 15658:2006**
- Shape, size, and colour: As per approved design and site requirement

Levelling / Bedding Sand

- A **35 mm thick layer of sand** shall be provided under paver blocks for levelling.
- Sand shall be **clean, sharp, and free from organic matter**.

2. WORKMANSHIP

1. Preparation of Subgrade

- Subgrade shall be properly **excavated, cleaned, and compacted** to required level and slope.
- Base shall be graded to ensure uniform drainage and stability.

2. Bedding Layer

- Provide **35 mm sand layer** over the compacted subgrade.
- Level and screed the sand to achieve uniform thickness and proper slope.

3. Laying of Paver Blocks

- Paver blocks shall be laid **tightly and in proper interlocking pattern** as per approved drawing.
- Blocks shall be laid in **straight lines and uniform alignment**.
- 4. **Joint Filling**
 - Joints between blocks shall be filled with **fine sand** and compacted using a **vibratory plate compactor**.
 - Additional sand shall be added and compacted until joints are fully filled.
- 5. **Finishing**
 - Surface shall be **level, uniform, and true to line and grade**.
 - All edges and corners shall be neat and properly aligned.
- 6. **Compaction**
 - The entire paved area shall be compacted using **mechanical or vibratory compaction equipment** to ensure proper interlocking and stability.

3. MODE OF MEASUREMENT & PAYMENT

1. **Unit of Measurement**
 - The paver blocks shall be measured in **Square Metres (Sqm)** of finished laid area.

Item No. 39

"FLAG STONE FLOORING : Providing and laying flag stone flooring over 25-35mm thick base of cement mortar 1:5 (1-Cement : 5-coarse sand) including pointing with cement mortar 1:2 (1-cement : 2-stone dust) etc. complete.

(a) VYARA_Flagstone shot blasted & coated finish (Rev 02) or equivalent Size, design, laying pattern and colour as per architect selection. .

(b) Finish : Premier shield protection (coated)

(C) Size :DL WP 300*450*60MM/ 300*600*60MM/ 300*300*60MM in SBPS finish with minimum average 3.5MPa bending strength at 28 days."

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Cement

Cement : Shall conform **M.3 Page No-9** in General Technical Specification Booklet.

Sand (Coarse and Fine / Stone Dust)

- Coarse Sand : Shall conform **M.6 Page No-10** in General Technical Specification Booklet.
- Stone Dust : Shall conform **M.7 Page No-10** in General Technical Specification Booklet.

Cement Mortar

- Base Bedding Mortar : **1:5 (1 Cement : 5 Coarse Sand)**
- Pointing / Joints Mortar : **1:2 (1 Cement : 2 Stone Dust)**
Shall conform **M.11 Page No-11** in General Technical Specification Booklet.

Flag Stones

- Type / Make: **VYARA_Flagstone shot blasted & coated finish (Rev 02) or approved equivalent**
- Finish: **Premier Shield Protection (coated)**
- Size Options: **DL WP 300×450×60 mm, 300×600×60 mm, 300×300×60 mm**
- Base Finish: **SBPS (Shot Blasted & Premier Shield) finish**
- Minimum average bending strength: **3.5 MPa at 28 days**
- Colour, size, pattern, and laying design as per **Architect / Engineer-in-Charge selection**

2. WORKMANSHIP

1. **Preparation of Base**
 - The base surface shall be **cleaned, leveled, and free of loose debris.**
 - Cement mortar bedding of **25–35 mm thickness (1:5 cement: coarse sand)** shall be laid over the prepared surface.
 - Bedding mortar shall be **properly leveled and compacted** to provide uniform support.
2. **Laying of Flag Stones**
 - Flag stones shall be **laid over the mortar bedding** in the pattern, orientation, and design approved by the Architect / Engineer-in-Charge.
 - Stones shall be **closely fitted** with minimum gaps and proper alignment.
 - Special care shall be taken to avoid cracking or chipping during placement.
3. **Pointing / Jointing**
 - Joints shall be **pointed with cement mortar 1:2 (1 cement : 2 stone dust).**
 - Mortar shall be worked into all joints properly and **finished flush with the stone surface.**
4. **Finishing**
 - After setting, the flooring shall be **cleaned thoroughly.**
 - Protective coating (Premier Shield) shall be applied as per manufacturer's instructions.
 - Finished surface shall be **level, uniform, and true to line and grade.**
5. **Curing and Protection**
 - Bedding and joints shall be cured for **minimum 7 days.**
 - Flooring shall be protected from **traffic, debris, or heavy loads** until curing is complete.
6. **Approval**
 - Colour, size, pattern, and finish shall be **as approved by Architect / Engineer-in-Charge.**
 - Only approved flag stones shall be used; defective stones shall be replaced at no extra cost.

3. MODE OF MEASUREMENT

1. **Unit of Measurement**
 - Flag stone flooring shall be measured in **Square Metres (Sqm)** of finished laid area.

Item No. 40

"**COBBLE STONE FLOORING** : Providing and laying cobble stone flooring over 25-35mm thick base of cement mortar 1:5 (1-Cement : 5-coarse sand) including pointing with cement mortar 1:2 (1-cement : 2-stone dust) etc. complete Size, design, laying pattern and colour as per architect selection.

(a) **VYARA_Cobble square 60mm shot blasted & coated finish (Rev 02) or equivalent.**

(b) **Finish : Premier shield protection (coated)**

(c) **Size : Supply of COBBLE SQ.-R RED DL CP , vyara or equivalent 60MM in SBPS finish with minimum average 200 KG/cm² compressive strength at 28 days."**

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Cement

Cement : Shall conform **M.3 Page No-9** in General Technical Specification Booklet.

Sand (Coarse and Stone Dust)

- Coarse Sand : Shall conform **M.6 Page No-10** in General Technical Specification Booklet.
- Stone Dust : Shall conform **M.7 Page No-10** in General Technical Specification Booklet.

Cement Mortar

- Base Bedding Mortar : **1:5 (1 Cement : 5 Coarse Sand)**
- Pointing / Joints Mortar : **1:2 (1 Cement : 2 Stone Dust)**
Shall conform **M.11 Page No-11** in General Technical Specification Booklet.

Cobble Stones

- Type / Make: **VYARA_Cobble Square 60 mm, shot blasted & coated finish (Rev 02) or approved equivalent**
- Finish: **Premier Shield Protection (coated)**
- Size: **60 mm thick; COBBLE SQ.-R RED DL CP or equivalent in SBPS finish**
- Minimum average compressive strength: **200 kg/cm² at 28 days**
- Colour, size, pattern, and laying design as per **Architect / Engineer-in-Charge selection**

2. WORKMANSHIP

1. Preparation of Base

- The base surface shall be **cleaned, leveled, and free of loose debris.**
- Cement mortar bedding of **25–35 mm thickness (1:5 cement: coarse sand)** shall be laid over the prepared surface.
- Bedding shall be **leveled and compacted** to ensure uniform support.

2. Laying of Cobble Stones

- Cobble stones shall be **laid over the mortar bedding** in the pattern, orientation, and design approved by the Architect / Engineer-in-Charge.
- Stones shall be **closely fitted** with minimum gaps and proper alignment.
- Care shall be taken to avoid chipping, cracking, or uneven surfaces.

3. Pointing / Jointing

- Joints shall be **pointed with cement mortar 1:2 (1 Cement : 2 Stone Dust).**
- Mortar shall be **worked fully into all joints** and finished flush with the stone surface.

4. Finishing

- After setting, flooring shall be **cleaned thoroughly.**
- Apply **Premier Shield protective coating** as per manufacturer's instructions.
- Finished surface shall be **level, uniform, and true to line, grade, and pattern.**

5. Curing and Protection

- Bedding and joints shall be cured for **minimum 7 days.**
- Flooring shall be **protected from traffic, debris, or heavy loads** until curing is complete.

6. Approval

- Colour, size, pattern, and finish shall be **as approved by Architect / Engineer-in-Charge.**
- Only approved cobble stones shall be used; defective stones shall be replaced at no extra cost.

3. MODE OF MEASUREMENT & PAYMENT

1. Unit of Measurement

- Cobble stone flooring shall be measured in **Square Metres (Sqm)** of finished laid area.

Item No. 41

"GRANITE STONE FLOORING (Canvas finish) : Providing and laying rough stone flooring over 75mm thick or Require for leveling base of cement mortar 1:3 (1-Cement : 3-coarse sand) laid and jointed with grey cement slurry including cutting, dressing, leveling, jointing, pointing, curing, finishing, rubbing and polishing complete including Labor Charges Quarter round edge for granite.

(a) Indian granite stone, as per selection

(b) thickness: 18mm,

(c) Finish:Lepatora

(d) The rate of the stone should NO'St be less than Rs. 125/sq.ft. Size, design, laying pattern and colour as per architect selection."

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Cement

Cement : Shall conform **M.3 Page No-9** in General Technical Specification Booklet.

Sand (Coarse / Fine)

Sand : Shall conform **M.6 Page No-10** in General Technical Specification Booklet.

Cement Mortar

- Base Mortar : **1:3 (1 Cement : 3 Coarse Sand)**
- Cement Slurry for jointing : Grey cement slurry
Shall conform **M.11 Page No-11** in General Technical Specification Booklet.

Granite Stone

- Type / Make: **Indian Granite, as per selection by Architect / Engineer-in-Charge**
- Thickness: **18 mm**
- Finish: **Lepatora / Canvas finish**
- Edge: **Quarter round edge as required**
- Rate: Not less than **Rs. 125 / sq.ft.**
- Colour, size, design, and laying pattern as per **Architect / Engineer-in-Charge selection**

2. WORKMANSHIP

1. **Preparation of Base**
 - The base shall be **leveled and compacted**.
 - Provide **75 mm thick (or as required) cement mortar (1:3)** for bedding and leveling.
 - Ensure proper slope and flatness for water drainage.
2. **Laying of Granite Stones**
 - Granite stones shall be **cut, dressed, and laid** over the mortar bed.
 - Stones shall be **closely fitted**, with uniform joints.
 - Orientation, pattern, and layout shall be as per **Architect / Engineer-in-Charge directions**.
3. **Jointing / Pointing**

- Joints shall be filled with **grey cement slurry**, worked properly into the joints, and finished flush.
- 4. **Finishing**
 - Stone surface shall be **rubbed, leveled, and polished** to achieve the Canvas / Lepatora finish.
 - Edges shall be finished **quarter round as required**.
- 5. **Curing and Protection**
 - Stone flooring and joints shall be **cured for minimum 7 days**.
 - Flooring shall be protected from traffic, debris, or heavy loads until fully cured.
- 6. **Approval**
 - Colour, size, thickness, pattern, and finish shall be **as approved by Architect / Engineer-in-Charge**.
 - Only approved granite stones shall be used; defective or damaged stones shall be replaced at no extra cost.

3. MODE OF MEASUREMENT & PAYMENT

1. **Unit of Measurement**
 - Granite flooring shall be measured in **Square Metres (Sqm)** of finished laid area.

Item No. 42

"GRANITE STONE FLOORING (Mirror Finish) : Providing and laying rough stone flooring over 75mm thick or Require for leveling base of cement mortar 1:3 (1-Cement : 3-coarse sand) laid and jointed with grey cement slurry including cutting, dressing, leveling, jointing, pointing, curing, finishing, rubbing and polishing complete including Labor Charges Quarter round edge for granite Size, design, laying pattern and colour as per architect selection..

(a) Indian granite stone, as per selection

(b) thickness:18mm,

(c) Finish:Mirror polish

(d) The rate of the stone should NO'St be less than Rs. 125/sq.ft.

"

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Cement

Cement : Shall conform **M.3 Page No-9** in General Technical Specification Booklet.

Sand (Coarse / Stone Dust)

- Coarse Sand : Shall conform **M.6 Page No-10** in General Technical Specification Booklet.
- Stone Dust : Shall conform **M.7 Page No-10** in General Technical Specification Booklet.

Cement Mortar

- Base Mortar : **1:3 (1 Cement : 3 Coarse Sand)**
- Jointing / Pointing : Grey cement slurry
Shall conform **M.11 Page No-11** in General Technical Specification Booklet.

Granite Stone

- Type / Make: **Indian Granite**, as per selection by Architect / Engineer-in-Charge
- Thickness: **18 mm**
- Finish: **Mirror polished finish**
- Edge: **Quarter round edge** as required
- Rate: Not less than **Rs. 125 / sq.ft.**
- Colour, size, design, and laying pattern as per **Architect / Engineer-in-Charge selection**

2. WORKMANSHIP

1. **Preparation of Base**
 - The base shall be **leveled, compacted, and free of debris.**
 - Provide **75 mm thick (or as required) cement mortar (1:3)** for bedding and leveling.
 - Ensure **uniform slope and flatness** for drainage and surface stability.
2. **Laying of Granite Stones**
 - Granite stones shall be **cut, dressed, and laid** over the mortar bed.
 - Stones shall be **closely fitted** with uniform joints.
 - Orientation, pattern, and layout shall be as per **Architect / Engineer-in-Charge directions.**
3. **Jointing / Pointing**
 - Joints shall be **filled with grey cement slurry**, worked into all joints, and finished flush.
4. **Finishing**
 - Stone surface shall be **rubbed, leveled, and mirror polished** as per specification.
 - Edges shall be finished with **quarter round** as required.
5. **Curing and Protection**
 - Flooring and joints shall be **cured for minimum 7 days.**
 - Flooring shall be **protected from traffic, debris, or heavy loads** until fully cured.
6. **Approval**
 - Colour, thickness, size, and pattern shall be **as approved by Architect / Engineer-in-Charge.**
 - Only approved granite stones shall be used; defective or damaged stones shall be replaced at no extra cost.

3. MODE OF MEASUREMENT

1. **Unit of Measurement**
 - Granite flooring shall be measured in **Square Metres (Sqm)** of finished laid area.

Item No. 43

"**GRANITE STONE FLOORING (leather,river)** : Providing and laying rough stone flooring over 75mm thick or Require for leveling base of cement mortar 1:3 (1-Cement : 3-coarse sand) laid and jointed with grey cement slurry including cutting, dressing, leveling, jointing, pointing, curing, finishing, rubbing and polishing complete including Labor Charges Quarter round edge for granite.

(a) Indian granite stone, as per selection

(b) thickness:18mm,

(c) Finish:leather, river or mirror as per selection

(d) The rate of the stone should NO'St be less than Rs. 125/sq.ft. Size, design, laying pattern and colour as per architect selection."

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Cement

Cement : Shall conform **M.3 Page No-9** in General Technical Specification Booklet.

Sand (Coarse / Stone Dust)

- Coarse Sand : Shall conform **M.6 Page No-10** in General Technical Specification Booklet.
- Stone Dust : Shall conform **M.7 Page No-10** in General Technical Specification Booklet.

Cement Mortar

- Base Mortar : **1:3 (1 Cement : 3 Coarse Sand)**
- Jointing / Pointing : Grey cement slurry
Shall conform **M.11 Page No-11** in General Technical Specification Booklet.

Granite Stone

- Type / Make: **Indian Granite, as per selection by Architect / Engineer-in-Charge**
- Thickness: **18 mm**
- Finish: **Leather, River, or Mirror finish as per selection**
- Edge: **Quarter round edge**
- Rate: Not less than **Rs. 125 / sq.ft.**
- Colour, size, design, and laying pattern as per **Architect / Engineer-in-Charge selection**

2. WORKMANSHIP

1. **Preparation of Base**
 - The base shall be **leveled, compacted, and cleaned**.
 - Provide **75 mm thick (or as required) cement mortar (1:3)** for bedding and leveling.
 - Ensure proper slope and flatness for drainage and surface stability.
2. **Laying of Granite Stones**
 - Granite stones shall be **cut, dressed, and laid** over the mortar bed.
 - Stones shall be **closely fitted** with uniform joints.
 - Orientation, pattern, and layout shall be as per **Architect / Engineer-in-Charge directions**.
3. **Jointing / Pointing**
 - Joints shall be **filled with grey cement slurry**, worked fully into all joints, and finished flush.
4. **Finishing**
 - Stone surface shall be **rubbed, leveled, and finished in Leather / River / Mirror finish** as specified.
 - Edges shall be finished with **quarter round** as required.
5. **Curing and Protection**
 - Flooring and joints shall be **cured for minimum 7 days**.
 - Flooring shall be **protected from traffic, debris, or heavy loads** until fully cured.
6. **Approval**
 - Colour, thickness, size, pattern, and finish shall be **as approved by Architect / Engineer-in-Charge**.
 - Only approved granite stones shall be used; defective or damaged stones shall be replaced at no extra cost.

3. MODE OF MEASUREMENT & PAYMENT

1. **Unit of Measurement**

- Granite flooring shall be measured in **Square Metres (Sqm)** of finished laid area.

Item No. 44

EXPOSE BENCH : Fabrication and manufacturing of solid precast concrete bench or other elements with provisions of shear keys, connecting loops, dowel tubes and proper lifting accessories for bench or other elements, of various thickness, shape and size of different concrete grades manufactured in controlled factory environment with approved methodology including moulds (Pallet system, Tilts form, table moulds, battery moulds, vertical moulds, beam moulds, column moulds, staircase moulds, Facade mould, etc.), mixing, transporting and placing of concrete, vibrating, curing, finishing, making necessary cutout/ holes of required sizes for services, yard handling & stacking all complete as per IS 11447:1985 and as per approved shop drawings and design mix as per the direction of Engineer-in-Charge (Cost of reinforcement, Mechanical, Electrical and Plumbing inserts will be paid separately). Concrete grade M-35 (Cement content 370 KGs) size of bench should be consider 1800x500x450mm. Design of the Bench as per the drawing.

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet.

Cement

Cement : Shall conform **M.3 Page No-9** in General Technical Specification Booklet.

Sand (Coarse / Fine)

Sand : Shall conform **M.6 Page No-10** in General Technical Specification Booklet.

Stone Aggregate / Grit

- Stone Grit / Coarse Aggregate : Shall conform **M.8 Page No-10** in General Technical Specification Booklet.

Reinforcement (if applicable)

- Reinforcement bars / rods: **FE 500D / HYSD bars** as per structural drawings (paid separately).
- Binders and loops for inserts as per approved shop drawings.

Concrete

- Grade: **M-35** (Cement content 370 kg / m³)
- Mix: As per approved **design mix** prepared under controlled factory environment.
- Standard: Manufactured and cured **in accordance with IS:11447:1985** and approved shop drawings.

Accessories

- Lifting loops, dowel tubes, shear keys, and cutouts for MEP services shall be provided as per approved design.

2. WORKMANSHIP

1. Fabrication / Casting

- Bench shall be **precast in a controlled factory environment** using approved moulds:

- Pallet system, tilt forms, table moulds, battery moulds, vertical moulds, beam moulds, column moulds, staircase moulds, façade moulds, or as per shop drawing.
- Concrete shall be **mixed, poured, and vibrated** to ensure **uniform compaction and dense finish**.
- Bench shall have **provisions for shear keys, connecting loops, dowel tubes, and lifting accessories** as per design.
- 2. **Finishing**
 - All exposed surfaces shall be **smooth, free of honeycombing, and finished as per approved texture / architectural design**.
 - Necessary **cutouts / holes for services** shall be made as per drawings.
- 3. **Curing**
 - Precast benches shall be **properly cured for a minimum period to achieve full design strength**.
- 4. **Handling and Stacking**
 - Benches shall be **handled, transported, and stacked** carefully in the yard to avoid damage.
 - Lifting accessories shall be checked before transportation.
- 5. **Installation**
 - Placement at site shall be done **as per approved drawings and Engineer-in-Charge directions**.
 - Proper leveling and alignment shall be ensured before fixing.
- 6. **Approval**
 - All benches shall conform to **dimensions 1800 x 500 x 450 mm** or as per design drawings.
 - Bench design, concrete grade, finish, and accessories shall be **approved by Engineer-in-Charge**.
 - Any damaged or defective benches shall be replaced **at no extra cost**.

3. MODE OF MEASUREMENT & PAYMENT

1. **Unit of Measurement**
 - Precast bench shall be measured **per item / each**.

Item No. 45

Signage :Manufacturing, supply, arrangement and keeping in good condition until project completion
SS/Wooden/MDF signage using SS 304 grade/Plywood/MDF material brush finish 1.5mm thick sheet with letter, numbers, graphic, symbol etc made by acid etching process with duco paint/ powder coating as per drawings and instruction of the architect. All required CNC cutting/ laser cutting shall be carried out as per drawing. The plate shall be fixed on brick/ RCC wall/ ply/ cement board/ furniture/ door with the necessary fixing hardware like SS stud, fastner, self adhesive double side tape etc. complete for all floors and all height. The rate shall be inclusive of all material, laour, hardware scaffolding etc. All product Make approved as per tender and architect selection or equivalent.

1. MATERIALS

Water

Water : Shall conform **M.1 Page No-9** in General Technical Specification Booklet (if required for cleaning / finishing).

Stainless Steel / Sheet Material

- Stainless Steel : **Grade 304, 1.5 mm thick**, brushed finish, conforming to **IS 6911 / ASTM A240** standards.

Plywood / MDF

- Plywood : Shall conform **M.37 Page No-18** in General Technical Specification Booklet.

- MDF : As per approved make and manufacturer's specifications.

Paint / Coating

- Duco Paint / Powder Coating : Shall conform to **IS 851 / IS 2932** or approved manufacturer's standards.

Fixing Hardware

- Stainless steel studs, fasteners, self-adhesive double-sided tapes, screws, or other approved fasteners as required for secure fixing on wall, door, furniture, or cement board.
- All hardware to be **corrosion resistant and approved by Engineer-in-Charge / Architect**.

Other Materials

- CNC / Laser Cutting Consumables : As per manufacturer's standards.
- Adhesives / bonding agents : Approved quality compatible with substrate.

2. WORKMANSHIP

1. Fabrication / Manufacturing

- Signage shall be **manufactured as per approved drawings and instructions** of the Architect / Engineer-in-Charge.
- Letters, numbers, symbols, and graphics shall be **cut or etched using CNC / Laser cutting techniques**.
- Acid etching or other approved methods shall be used for SS signs for permanent marking.
- Surfaces to be **brush-finished (SS) or smooth (Plywood / MDF)** and properly coated with duco paint or powder coating.

2. Installation / Fixing

- Plates shall be fixed **on brick, RCC walls, plywood panels, cement boards, furniture, or doors**.
- Fixing shall include **SS studs, fasteners, screws, or self-adhesive double-sided tape**, ensuring a **firm, level, and durable installation**.
- Signage shall be installed at all heights and floors as per drawings and Architect directions.

3. Protection and Maintenance

- Signage shall be **protected from scratches, dust, paint, or damage** during storage, transport, and installation.
- Any damaged or defective signage shall be replaced at **no extra cost**.

4. Approval

- All materials, finishes, colours, fonts, graphics, and installation methods shall be **approved by Architect / Engineer-in-Charge** before final installation.
- Only approved makes as per **tender or Architect selection** shall be used.

3. MODE OF MEASUREMENT & PAYMENT

1. Unit of Measurement

- Signage shall be measured **per square meter (Sq.m) of face area** as specified in the BOQ.

Item No. 46

"ENTRY SIGNAGE : Providing and fixing of Stainless Steel letters (Grade 304), as per approved architectural drawings and Engineer-in-Charge's directions. The work includes:

- a. **Material:** Fabricated letters from SS Grade 304 sheet, thickness:1.5 mm, with a brushed/polished/golden PVD coated finish.
- b. **Fabrication:** Letters to be 150 mm minimum height for main text, with raising/depth:25 mm.
- c. **Fixing:** Securely fixed to the existing surface using concealed stainless steel studs and a suitable sealant/epoxy adhesive, ensuring no fixings are visible from the front.
- d. **Inclusions:** All necessary shop drawings, cutting, bending, transportation to site, installation, testing."

1. MATERIALS

Stainless Steel

- Material: **SS Grade 304** sheet, thickness **1.5 mm**, brushed / polished / golden PVD coated finish.
- Standard: Shall conform to **IS 6911 / ASTM A240** standards.

Sealant / Adhesive

- Epoxy adhesive / approved sealant compatible with SS and substrate, ensuring **permanent and durable fixing**.

Fixing Hardware

- Concealed **stainless steel studs** and fasteners, corrosion-resistant and suitable for the substrate.

Other Materials

- Cutting, bending, and protective masking materials as required for fabrication and installation.

2. WORKMANSHIP

1. Fabrication

- Letters to be fabricated **as per approved architectural drawings and shop drawings**.
- Minimum height: **150 mm** for main text.
- Depth / Raising: **25 mm**.
- Letters shall be **precisely cut using CNC / laser cutting**.
- All surfaces shall be **smooth, free from burrs or sharp edges**.
- Finish: **Brushed / Polished / Golden PVD coated** as approved.

2. Fixing / Installation

- Letters shall be securely fixed to the existing surface using **concealed stainless steel studs**.
- Epoxy adhesive or suitable sealant shall be used to ensure **permanent and flush installation**.
- No fixings shall be visible from the front; alignment and level to be strictly maintained.

3. Approval

- Fabrication, finish, colour, size, depth, and fixing method shall be **approved by Architect / Engineer-in-Charge** before installation.
- Any damaged or defective letters shall be replaced **at no extra cost**.

4. Protection & Maintenance

- Letters shall be **protected during handling, transportation, and installation** to prevent scratches or dents.
- All surfaces shall be cleaned and free from dust or adhesive residue after installation.

3. MODE OF MEASUREMENT & PAYMENT

1. Unit of Measurement

- Entry signage shall be measured **per item / each**

Item No. 47

MAP SIGNAGE : with pole - SS Plate Size : 2' x 3' or equivalent - Grade 304, Brush Finish, 2mm Thickness with Smoothen Corner edges, Acid etching with duco colour, Logo cutting in waterjet CNC machine, Supported at 45 degree Pole 2' long Double pole, 50mm square MS pipe with Zinc coating & Paint, 1.5' deep Foundation with concrete work & Transportation.

1. MATERIALS

Stainless Steel Plate

- Material: **SS Grade 304**, brush finish, thickness **2 mm**, smoothened corner edges.
- Standard: Shall conform to **IS 6911 / ASTM A240**.
- Surface treatment: **Acid etching** with duco colour, logos and graphics cut using **Waterjet / CNC**.

Support Poles

- Material: **MS square pipe 50 mm**, double pole arrangement.
- Surface treatment: **Zinc coated and painted** for corrosion resistance.
- Pole Length: **2 ft** with mounting at **45-degree inclination**.

Foundation / Concrete

- Material: **Concrete M20** for 1.5 ft deep foundation including excavation and reinforcement if required.
- Standard: Shall conform to **IS 456:2000**.

Fixing / Fasteners

- All bolts, nuts, washers, and fixing accessories shall be **stainless steel / corrosion-resistant**.

Other Materials

- Adhesives, grout, or sealants as required for finishing.
- Protective masking for plate during transport and installation.

2. WORKMANSHIP

1. Fabrication of Plate

- Stainless steel plates shall be **cut to 2' x 3' (or equivalent)** with **smooth edges**.
- Logos, graphics, and lettering shall be **cut using CNC / Waterjet machine**.
- Plate shall be **acid etched and duco coloured** as per approved design.
- Surfaces shall be **smooth, free of scratches, burrs, and defects**.

2. Fabrication of Pole / Support

- Poles shall be **cut, welded, and zinc-coated**, painted to approved colour.
- Double pole arrangement shall be **installed at 45-degree inclination** to support the sign.

3. Foundation / Installation

- Excavation for foundation: **1.5 ft deep** with proper alignment and level.
- Concrete M20 shall be poured, compacted, and cured for minimum 7 days.
- Signage plates shall be securely fixed to poles using **stainless steel fasteners**, ensuring stability and alignment.

4. Protection and Maintenance

- Signage and poles shall be **protected during transport and installation**.
 - Any scratches, dents, or defects shall be **rectified or replaced at no extra cost**.
5. **Approval**
- Size, finish, colour, logo, and installation details shall be **approved by Architect / Engineer-in-Charge** prior to fabrication and installation.

3. MODE OF MEASUREMENT & PAYMENT

1. Unit of Measurement

- Map signage with pole shall be measured **per item / each** including plate, pole, and foundation.

Item No. 48

SCULPTURE & FOUNTAIN & DECORATIVE ITEMS : Indian natural stone sculpture in abstract form, made of Indian sandstone, marble or granite using various tool and tackle to give aesthetically appealing surface textures, polishing, form and effects as per design and specifications given by the architect or EIC. The item to include all materials, workmanship, transportation & handling, lifting and placing on site along with any anchorage, supports as required. (Out to out volumetric dimensions to be considered)

1. MATERIALS

Natural Stone

- Material: **Indian sandstone, marble, or granite** as per approved selection.
- Quality: **Free from cracks, defects, veins, and discoloration**, suitable for carving and finishing.
- Conformance: Shall conform to **IS 1123 / IS 458** or relevant IS standard for natural stones.

Anchorage / Supports

- Mild steel / stainless steel anchors, rods, brackets, or fixing hardware as required.
- All metal components to be **corrosion-resistant** (zinc-coated / stainless steel) as approved.

Other Materials

- Epoxy / cement-based adhesive or grout for fixing as required.
- Protective packing / cushioning material for **transportation and handling**.

2. WORKMANSHIP

1. Fabrication / Carving

- Sculptures, fountains, and decorative items shall be **carved, sculpted, and shaped** using approved **hand and power tools** to achieve the design, forms, textures, and aesthetic effects.
- Polishing, finishing, and surface treatment shall be carried out to **produce smooth, uniform, and defect-free surfaces** where required.
- All **edges, curves, and details** to be as per architect-approved drawings and samples.

2. Anchorage & Support

- Anchoring, supports, and internal structural elements shall be provided to **ensure stability and safety**.
- Connections shall be **concealed wherever possible** and structurally adequate for load-bearing and wind / seismic effects.

3. Transportation & Handling

- Items shall be **carefully packed and transported** to the site without damage.

- Handling at site shall include **lifting, placing, leveling, and securing** using approved tools and machinery.
- 4. **Installation**
 - Installation shall be as per **approved drawings, levels, and locations**.
 - Anchoring, grouting, or fixing shall be completed **fully and securely**, with alignment and plumb ensured.
 - Minor adjustments to achieve **aesthetic alignment** are included in the rate.
- 5. **Protection & Maintenance**
 - All items shall be **protected until project completion** against scratches, dirt, or damage.
 - Damaged or defective items shall be **replaced or rectified at no extra cost**.
- 6. **Approval**
 - Final sculpture, fountain, or decorative item shall **match the approved design, dimensions, finish, and texture**.
 - Out-to-out volumetric dimensions shall be **considered for measurement and payment**.

3. MODE OF MEASUREMENT & PAYMENT

- 1. **Unit of Measurement**
 - The items shall be measured **per cubic meter (m³) of finished stone sculpture / fountain / decorative item**.

Item No. 49

GRC CLADDING : Providing & fixing architectural moldings profiles and other decorative elements made out of GRC (Glass Fibre reinforced Cement) in required shape, size & thickness all as per manufacturers specifications, such as all decorative articles should be made by using high power spray machine, using AR Glass fiber with minimum ZrO₂ 16% including necessary scaffoldings for all heights, as per approved drawings and reference images. GRC elements thickness shall be 25-30 mm. fixing edges will be GRC Elements shall be fixed on RCC Structure/Brick Work/ Primary Steel Structure (MS (18 kg/Smt) with protective coat of Red oxide/Zinc Primer Shall be Used). Hilti make GI Screw Fastners or equivalent, GI Thread Rods and MS cleats shall be used for fixing of GRC elements on RCC/MS Primary fabricated structure. Joints shall be filled with PU sealants/ base material of GRC as and where required. The quote rate shall be inclusive of all design, & shop drawing and sample mock of all elements approval from Architect & consultant. The quote rate shall include all Taxes, duties, statutory obligations and safety code compliance as per client. Rate shall be inclusive of all required fabrication work for fixing only primary structure shall be provided as base structure only as per requirement. Mode and method of measurement shall be in accordance with IS: 1200.a) GRC Columns: as per specification work (Elevation area- At any height) (Elevation area)

1. MATERIALS

Glass Fibre Reinforced Cement (GRC)

- Material: High-quality **GRC (Glass Fibre Reinforced Cement)** with AR (Alkali-Resistant) Glass Fibre.
- Minimum ZrO₂ content: **16%** in fibres.
- Thickness: **25–30 mm** for all decorative elements.
- Elements to be **molded using high-pressure spray machines** as per manufacturer's specifications.
- Surface finish and texture: As per **approved drawings, reference images, and mock-ups**.

Primary Structural Support

- RCC / Brickwork / MS steel fabricated structure as base for GRC elements.
- MS Structural elements: **18 kg/sqm**, with protective **Red Oxide / Zinc Primer** coating.

Fixings / Fasteners

- Hilti GI screws or equivalent approved fasteners.
- GI Threaded rods and MS cleats for structural connections.
- All fasteners to be **corrosion-resistant** and suitable for the designed loads.

Jointing / Sealants

- PU sealant / GRC-compatible base material for filling joints.
- Colour and texture of joints to match GRC elements.

Other Materials

- Scaffoldings, lifting accessories, temporary supports.
- Protective packing for transport of GRC elements.
- All adhesives, primers, or coatings as per manufacturer's instructions.

2. WORKMANSHIP

1. Fabrication

- GRC elements to be fabricated **strictly as per approved shop drawings and mock-up samples**.
- High-pressure spray machine to be used for molding elements.
- Ensure **uniform thickness, shape, and smooth edges**.
- Elements shall be **cured, hardened, and finished** before transportation.

2. Fixing / Installation

- GRC elements shall be fixed on **RCC / Brickwork / MS primary structure** using **GI screws, threaded rods, and MS cleats**.
- Joints between elements shall be filled with **PU sealant or GRC-compatible material** to ensure seamless appearance.
- Elements shall be installed at **any height** using scaffolding, lifts, and safety measures as required.

3. Approval

- All shop drawings, mock-ups, finishes, textures, and jointing details shall be **approved by Architect / Engineer-in-Charge** prior to fabrication.
- Any rejected or damaged elements shall be **replaced at no extra cost**.

4. Protection and Safety

- All elements shall be **protected during transport, handling, and installation**.
- Work shall comply with all **statutory safety codes, client safety norms, and site regulations**.

3. MODE OF MEASUREMENT & PAYMENT

1. Unit of Measurement

- **GRC Columns / Cladding / Decorative elements** shall be measured **per square meter of elevation area**.

Item No. 50

BAMBOO PANELING : Manufacturing, supply , arrangement and keeping in good condition until project completion of Bamboo strips panelled ceiling as required to be fitted with the help of MS framing at all heights/all levels in Fancing work with Borex treatment on bamboo & PU polish at regular intervals for Look . Make as per design and drawing with necessary arrangement like fix on MS frame 45*45*3mm Angle similar etc. with the help of fixtures such as bonding agents such as fevicol, screws and framing

with of any diameter, fixing with the help of gripper or relevant technique etc. complete of design provided by the architect and should be installed as per the directions provided by the engineer-in-charge. Make as per tender or Equivalent.

1. MATERIALS

Bamboo Strips / Panels

- Material: **Mature, high-quality bamboo strips** suitable for paneling.
- Treatment: **Borex or equivalent anti-termite / anti-fungal treatment** prior to installation.
- Surface finish: **PU polish** applied at regular intervals for aesthetics and protection.
- Dimensions: As per approved **architectural design and drawings**.

MS Framing

- Material: **Mild steel (MS) angles / framing** – size **45 × 45 × 3 mm** or as approved.
- Surface treatment: **Red oxide / zinc primer** to prevent corrosion.
- Arrangement: Framing to support bamboo panels at **all heights / levels**.

Fixing / Fasteners

- Screws, bolts, bonding agents (e.g., Fevicol / equivalent), grippers, and other approved fixtures for secure fixing.
- All fasteners to be **corrosion-resistant** and suitable for intended load.

Other Materials

- Adhesives, primers, fillers, and sealants compatible with bamboo and steel.
- Scaffoldings or temporary supports for installation at height.

2. WORKMANSHIP

1. Fabrication / Preparation

- Bamboo strips shall be **cut, polished, treated, and pre-assembled** as required.
- Borex treatment shall ensure **termite resistance and durability**.
- PU polish shall be **uniformly applied** for aesthetic finish.

2. Frame Installation

- MS angles / frames shall be **installed as per drawings**, securely fixed to walls or ceilings.
- Frames shall be **plumbed, leveled, and aligned** for panel placement.

3. Panel Fixing

- Bamboo strips/panels shall be **fixed on MS frame** using approved **bonding agents, screws, grippers, or other approved methods**.
- All joints shall be **tight, uniform, and seamless**, with aesthetic alignment.
- Panels shall be installed at **all specified heights and levels**, including corners, junctions, and cutouts.

4. Finishing & Protection

- Panels shall be **cleaned, polished, and inspected** after installation.
- Protective measures shall be taken during **transportation, handling, and installation**.
- Any damaged panels shall be **replaced at no extra cost**.

5. Approval

- All work shall be carried out as per **architect-approved design, drawings, and samples**.
- Engineer-in-Charge shall approve **alignment, finish, and installation methodology**.

3. MODE OF MEASUREMENT & PAYMENT

1. Unit of Measurement

- Bamboo paneling shall be measured **per square meter (m²) of finished panel surface** including cutouts, corners, and junctions.

Item No. 51

Removing Paver Block - Removing existing interlocking cement concrete paver blocks of any size and thickness from paved areas, including lifting, dismantling, stacking of serviceable pavers separately for reuse at designated location, disposal of unserviceable material, and clearing the site complete. The item includes careful removal without damaging adjoining pavements, kerbs, or services, cleaning of paver blocks, and transportation within site limits as directed by the Engineer-in-Charge. Rate shall include all labour, tools, equipment, handling, loading, unloading, and incidentals, complete.

1. MATERIALS

- No new materials are involved in this item.
- Existing interlocking cement concrete paver blocks (of any size and thickness) are to be **removed, cleaned, and stacked** for reuse or disposal.

2. WORKMANSHIP

- Careful Removal**
 - Paver blocks shall be **carefully lifted and dismantled** using appropriate hand tools, crowbars, or mechanical aids to avoid damage to:
 - Adjoining pavements
 - Kerbs
 - Underground utilities / services
- Sorting & Stacking**
 - **Serviceable paver blocks** shall be cleaned of mortar, dirt, or debris and **stacked separately** at designated locations within the site.
 - **Unserviceable / damaged paver blocks** shall be **disposed of as per site directions**.
- Transportation**
 - Paver blocks shall be **transported within site limits** to stacking / reuse / disposal areas using manual or mechanical methods.
 - Care shall be taken to **prevent breakage or damage during transport**.
- Cleaning & Site Clearance**
 - All **residual debris, dust, or loose material** shall be **cleared from the site** after removal.
 - The site shall be left **clean, safe, and level**.
- Safety**
 - Proper **PPE (Personal Protective Equipment)** shall be used by all workers.
 - Work shall be carried out **without causing hazard to adjacent areas, personnel, or services**.

3. MODE OF MEASUREMENT & PAYMENT

1. Measurement shall be made in **square meters (m²) of paved area from which paver blocks are removed**.

Item No. 52

"GRASS PAVER : Providing and laying precast concrete grass pavers of specified dimensions 600mm x 400mm x 75mm, with open grid design to allow for grass growth, including leveling, joint filling with suitable material, and compaction, complete as per manufacturer's specifications and as directed by the Engineer

(a) VYARA_Ecological paver_grid paver

(b) Finish : Shotblasted with premiership protection (coated)

(c) HB Internal (Radius 3,6,10 mtr) 780x255x125mm"

1. MATERIALS

Water: Shall conform to M1 page no-9 in General Technical Specification Booklet

Cement: Shall conform M3 page no-9 in General Technical Specification Booklet

Sand: Shall conform M6 page no-10 in General Technical Specification Booklet

Stone Grit / Coarse Aggregate: Shall conform M8 page no-9 in General Technical Specification Booklet

Stone Dust / Fine Aggregate: Shall conform M7 page no-10 in General Technical Specification Booklet

Steel Reinforcement (if any for structural pavers):

- Mild Steel Bars: Shall conform M18 page no-13 in General Technical Specification Booklet
- High Yield Strength Deformed Bars: Shall conform M19 page no-13 in General Technical Specification Booklet
- Mild Steel Binding Wires: Shall conform M21 page no-14 in General Technical Specification Booklet

Protective Coating / Finishing:

- Shotblasted & PremierShield Protection: As per manufacturer's specifications and approved quality standards

Joint Filling Material:

- Washed sand / suitable non-shrinking filling material conforming to CPWD standards

2. WORKMANSHIP

1. Preparation of Base:

- Excavate and prepare base to the required level and slope.
- Compact sub-base to minimum 95% Proctor density.
- Lay a leveling layer of coarse sand / stone dust as per IS 383 / CPWD standards.

2. Handling and Laying Pavers:

- Pavers to be laid carefully to avoid chipping or cracking.
- Maintain uniform joint width (typically 3–5 mm).
- Use string lines and proper alignment to maintain level and slope.
- Place pavers on prepared bed without voids beneath.

3. Joint Filling:

- Fill joints with washed sand / approved material.
- Compact joints thoroughly to ensure paver stability.

4. Compaction:

- Use hand tampers or plate compactors to lightly compact pavers without damaging edges.

5. Finishing and Cleaning:

- Remove excess joint material.

- Clean surface to remove dirt, dust, or residual cement slurry.
 - Apply protective coating if specified (e.g., PremierShield).
6. **Tolerances:**
- Level variation: ± 3 mm per meter.
 - Alignment deviation: ± 5 mm over 3 meters.
 - Joint width: ± 1 mm.

3. MODE OF MEASUREMENT & PAYMENT

1. **Unit of Measurement:**
- Square meter (m^2) for paved surface

Item No. 53

Road marking with hot applied thermoplastic paints with reflectorising glass beads on bitumin surface providing and laying a hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250gms per sqm area, thickness of 2.5mm is excluding of surface applied glass beds as per IRC:35-2015. The finished surface to be level, uniform and free from streaks and holes. zebra patta /bump patta lane/center line/ edge line/cut patta. The white color marking should provide liminance coefficinnet on cemend road shall be min 130 mcd/m²/lux and Asphalt road shall be min 100 mcd/m²/lux during the service life during the day time. The marking should meet the performance criteria for night time reflectivity, wet reflectivity and skid resistance as mentioned in the section-15 of IRC 35-2015. Warranty for the Retro reflectivity should be two years.

1. MATERIALS

1.1 Thermoplastic Paint:

- **Type:** Hot-applied, durable thermoplastic road marking compound.
- **Thickness:** 2.5 mm **excluding** surface-applied glass beads.
- **Color:** White (or as specified) with luminance coefficient:
 - Cement concrete road: ≥ 130 mcd/m²/lux (daytime)
 - Asphalt road: ≥ 100 mcd/m²/lux (daytime)
- **Properties:**
 - Must meet IRC:35-2015 Section 15 for night-time reflectivity, wet reflectivity, and skid resistance.
 - Should withstand traffic abrasion and weather conditions during service life.

1.2 Reflective Glass Beads:

- **Application:** Broadcasted @ 250 g/m² on freshly laid thermoplastic paint.
- **Specifications:** As per IRC:35-2015
- **Properties:**
 - Spherical glass beads
 - High retro-reflectivity
 - Uniform size distribution

1.3 Surface Preparation Materials:

- Bituminous surface free of loose particles, oil, dust, and moisture.
- Cleaning material: Air blower / wire brush / water jet (as approved).

2. WORKMANSHIP

2.1 Surface Preparation:

- The road surface shall be dry, clean, and free from dirt, oil, loose material, or other contaminants.

- Repair cracks and potholes before application of thermoplastic paint.
- For uneven surfaces, apply a primer if recommended by manufacturer.

2.2 Application of Thermoplastic Paint:

- Heat the thermoplastic compound to the recommended temperature (as per manufacturer instructions).
- Apply using suitable machinery (screed or extrusion machine) or manually with proper care for uniformity.
- Maintain thickness of 2.5 mm \pm 0.25 mm excluding beads.
- Ensure straight and uniform edges; no streaks, holes, or uneven patches.

2.3 Application of Glass Beads:

- Immediately after laying thermoplastic paint, uniformly sprinkle glass beads @ 250 g/m².
- Ensure proper embedment into the paint surface without displacing the paint.

2.4 Finishing:

- Ensure lines, zebra patterns, and symbols are uniform, straight, and free from defects.
- Maintain alignment and spacing as per IRC standards.
- Curing is not required; allow cooling to ambient temperature before opening to traffic.

2.5 Performance Requirements:

- Retro-reflectivity: Maintain required night-time reflectivity throughout service life.
- Skid resistance: Must meet IRC:35-2015 Section 15.
- Warranty: Two years for retro-reflectivity.

2.6 Tolerances:

- Line thickness: \pm 0.25 mm
- Width: \pm 5 mm
- Luminance and retro-reflectivity: as per IRC:35-2015

3. MODE OF MEASUREMENT & PAYMENT

Unit of Measurement:

- Square meter (m²)

Item No. 54

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 \pm 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. MATERIALS

1.1 Body Material:

- **Material:** High-quality **Polycarbonate and ABS moulded body**.
- **Properties:**
 - Resistant to UV, abrasion, and weathering.
 - Capable of supporting **load up to 13,635 kg** (as per ASTM D 4280 Type H).
 - Body to have **finger grips** for easy placement.

1.2 Reflective Panels:

- **Material:** Micro-prismatic lens panels (No glass beads).
- **Properties:**
 - Provides total internal reflection of light entering the lens face.
 - Minimum reflective area: 13 cm² per side.
 - Slope to base: 35° ± 5° to optimize visibility.

1.3 Adhesive / Bonding Material:

- **Type:** Epoxy or bituminous adhesive recommended by the manufacturer.
- **Properties:**
 - Suitable for high-strength bonding on asphalt or cement concrete surfaces.
 - Resistant to traffic, weather, and temperature variations.

1.4 Dimensions:

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

1.5 Color:

- As per **IRC:35-2015** for lane designation (White, Yellow, Red, or as directed by Engineer-in-Charge).

1.6 Standards & References:

- ASTM D 4280 Type H – Raised Pavement Markers
- MORTH Circular No. RW/NH/33023/10-97 – Category A markers
- IRC:35-2015 – Road marking and retroreflective performance

2. WORKMANSHIP

2.1 Surface Preparation:

- Ensure the road surface (asphalt or cement concrete) is **clean, dry, and free from loose debris, oil, or dust**.
- Minor cracks or unevenness should be repaired before placing markers.

2.2 Marker Placement:

- Apply **adhesive as recommended by the manufacturer** (epoxy or bituminous).
- Place RPM firmly with finger grips for **accurate alignment**.
- Maintain **correct spacing** and orientation for visibility according to IRC:35-2015.
- Markers must **remain vertical and stable** after placement.

2.3 Curing / Setting:

- Allow adhesive to cure as per manufacturer's instructions before opening to traffic.

2.4 Performance Requirements:

- **Load Bearing:** Minimum 13,635 kg without deformation.
- **Retroreflectivity:** Maintain high visibility at night and in wet conditions.
- **Durability:** Resistant to UV, abrasion, oil, and temperature extremes.

2.5 Tolerances:

- Height, width, length: ± 2 mm
- Reflective area: ± 1 cm²
- Placement slope: $35^\circ \pm 5^\circ$

3. MODE OF MEASUREMENT & PAYMENT

Unit of Measurement:

- **Number (No.)** of markers installed.

Item No. 55

"RCC GSRs AND/OR SUMPS

Preparing structural design of 1 lacs liters (Partition wall for fire and water Supply) RCC (all Part of Tank) Underground / Partially underground of required capacity as per relevant I.S. s and constructing the same , including excavation in all types of soil strata (Including Rock) and shoring strutting if required, for loose soil/ to protect from collapse due to nearby traffic load, casting 100 mm thick PCC leveling course in M-15 , refilling the pit with proper soil and disposing the surplus stuff within a lead of 50 meters. Including water proof cement plaster CM 1:2 with approved water proofing compound to inside water touching surface to container with all type of labour and material charges of lowering, laying, erecting/ hosting and jointing of pipe assembly to inlet, outlet, overflow, and washout and by pass arrangement as per hydraulic design. Providing and fixing accessories like GI Ladder, CI Manhole frame and cover, water level indicator, adequate CI cowl type ventilators or lantern type ventilator with stainless steel jali. B.B Chambers for valves. Providing and applying three coats of water proof cement paint/snowcap to the outside face of the structure. It also includes satisfactory water tightness Test as per relevant I .S. code and painting name of the scheme and capacity & grade of the tank as per direction of engineer in charge in P.C.C. M15, RCC M30, and plaster in 15 mm."

1. MATERIALS

1.1 Water:

- Shall conform to **M1 page no-9** in General Technical Specification Booklet.

1.2 Cement:

- Shall conform **M3 page no-9** in General Technical Specification Booklet.

1.3 Sand (Fine Aggregate):

- Shall conform **M6 page no-10** in General Technical Specification Booklet.

1.4 Stone Grit / Coarse Aggregate:

- Shall conform **M8 page no-9** in General Technical Specification Booklet.

1.5 Steel Reinforcement:

- **Mild Steel Bars:** Shall conform **M18 page no-13** in General Technical Specification Booklet.
- **High Yield Strength Deformed Bars:** Shall conform **M19 page no-13** in General Technical Specification Booklet.
- **Mild Steel Binding Wires:** Shall conform **M21 page no-14** in General Technical Specification Booklet.

1.6 Concrete:

- **PCC for leveling course:** M15 grade.
- **RCC for tank walls, roof, and base:** M30 grade.

1.7 Plaster / Waterproofing:

- **Cement Mortar (CM 1:2) with waterproofing compound:** Shall conform **M11 page no-11**.
- **External waterproofing coats:** Three coats of approved water-proof cement paint / Snowcap.

1.8 Pipes and Fittings:

- GI / CI pipe assemblies for inlet, outlet, overflow, washout, and bypass.
- Accessories such as **CI manhole frame and cover, GI ladder, water level indicator, ventilators with stainless steel jali, BB chambers for valves.**

1.9 Miscellaneous:

- **Paints for external identification / capacity marking:** Shall conform **M44 page no-21**.

All materials shall be **approved by Engineer-in-Charge** and accompanied by manufacturer's test certificates.

2. WORKMANSHIP

2.1 Excavation:

- Excavate in all types of soil including **rock strata**.
- Provide **shoring and strutting** for loose soil or in areas near traffic to prevent collapse.
- Dispose of surplus excavated material within 50 m lead.

2.2 PCC Leveling:

- Lay **100 mm thick PCC M15 leveling course** at base of excavation.
- Compact thoroughly to achieve uniform level.

2.3 RCC Construction:

- Construct **RCC M30 walls, base, and roof** as per **structural design**.
- Ensure proper compaction, curing, and formwork (shuttering) to maintain dimensions and surface finish.
- Provide **partition walls** for fire and water supply separation.

2.4 Waterproofing:

- Internal surfaces exposed to water shall be plastered with **CM 1:2 + approved waterproofing compound**.
- External surfaces shall receive **three coats of water-proof cement paint or Snowcap**.
- Conduct **water-tightness test** as per relevant IS code.

2.5 Pipe Assembly and Accessories:

- Install **GI/CI pipe inlets, outlets, overflows, washouts, bypasses** with proper jointing.
- Provide **GI ladder, CI manhole frame & cover, ventilators, stainless steel jali, water level indicator**.
- Ensure all accessories are **accurately aligned, rigidly fixed, and leak-proof**.

2.6 Finishing and Painting:

- External surfaces to be painted with **scheme name, capacity, and grade of tank**.
- Maintain neat, uniform finish on all visible surfaces.

2.7 Tolerances:

- RCC dimensional tolerance: ± 10 mm
- Plaster thickness: ± 2 mm
- Water level: as per design

3. MODE OF MEASUREMENT & PAYMENT

Unit of Measurement:

- Each / No.

Item No. 55

"Percolation Well -Boring dia.450mm and Sinking -100 rmt depth 20 cm. Diameter PVC pipe. Percolation well with casing pipes as per specifications with any approved system like Auger, Derrick etc. including installation of other equipments such as Pumps, Water Tanks, etc. complete and thereafter withdrawal and removal of the system etc. complete and clearing the site on completion.,

(1.)Providing and Constructing of 25000 liter Collection tank of 3.0 dia with 3.0 meter liquid depth including excavation, 100 mm thick PCC in 1:4:8 at bottom of brick foundation, 350 mm thick brick masonry up to 3.0 meter and 450 mm thick brick masonry from 3.01 meter to PCC top in 1:6 cement mortar, 15 mm thick cement finish plaster on inside & outside surface of the walls in 1:4 cement mortar, 125 mm thick RCC slab in 1:2:4 with 2 nos of 600 mm x 600 mm manhole cover with frame at the top of collection pit, filling of 600 mm thick over burnt brickbats at the bottom of well, 150 mm wide CI rungs in walls at 600 mm c/c distance, providing of 150 mm diameter PVC sleeves in between collection tank and filtration tank and back filling of trenches with proper compaction etc. as per detail given by the engineer in charge.(Civil works to be done by civil contractor as per the structural and plumbing drawings) .

(2)Providing and constructing of 20000 liter Filtration channel of 750 mm wide and 2 meter deep around the 3.0 m dia. collection tank including excavation, 100 mm thick PCC in 1:4:8 at bottom, 350 mm thick brick masonry in 1:6 cement mortar, 15 mm thick cement finish plaster on inside & outside surface of the walls in 1:4 cement mortar, filling of 300 mm thick 20 to 40 mm size and 300 mm thick 10 to 20 mm size gravels, providing and fabrication of MS grills on top of filtration channel and back filling of trenches with proper compaction etc. as per detail given by the engineer in charge. Supplying, lowering, fitting, fixing and joining with Strainer, 15 cm. diameter M.S. Pipe of minimum 5.40 mm wall thickness (DIAMETER –

ERW or equivalent make) with sockets, specials complete with cutting, threading and red lead paint, etc. complete up to the required depth.

(3) Supplying, lowering, fitting, fixing and joining with 40 rmt Strainer, 20 cm. diameter PVC Pipe CM class of minimum 10 mm wall thickness with sockets, specials complete with cutting, threading etc. complete up to the required depth.

(4) Supplying, fitting, fixing and lowering 20 cm. diameter strainer pipes 20 rmt having slot size 1.5 mm x 57 mm (72 slots in one line) in the casing pipe to the required depth as per direction of the employer.

(5) Supplying, fitting, fixing and lowering 2 no. 30 cm. diameter strainer pipe 1.2 m long having slot size 1.5 mm x 57 mm (72 slots in one line) in the casing pipe to the required depth as per direction of the employer.

(6) Providing and lowering 1 set 20 cm size PVC (3 m long) bail plug to the bore hole.

(7) Supplying, washing and shrouding with as per required quantity and grade of gravel, the annular gap between the casing pipe and the remaining annular space to be filled in with puddle clay .

(8) Hire and labour charges for necessary tools and plants for conducting proper tests for percolation water, lowering strainers to the required depth, uncovering the strainer by withdrawing the casing pipe, pumping water by suitable means withdrawing the strainers, lowering casing pipes to the required depth all complete as per direction and satisfaction of the employer."

1. MATERIALS

1.1 Water:

- Shall conform to **M1 page no-9** in General Technical Specification Booklet.

1.2 Cement:

- Shall conform to **M3 page no-9** in General Technical Specification Booklet.

1.3 Sand (Fine Aggregate):

- Shall conform to **M6 page no-10** in General Technical Specification Booklet.

1.4 Stone Aggregate / Brickbats / Gravels:

- Coarse aggregate for PCC: Shall conform **M8 page no-9**
- Over-burnt brickbats and gravels: Shall be clean, graded, and free from organic matter or silt.

1.5 Concrete / Mortar:

- PCC: M15 (1:4:8) as leveling course
- RCC Slab: M20/M25 or as per structural drawings
- Brick masonry:
 - Up to 3 m: 350 mm thick in 1:6 cement mortar
 - Above 3 m: 450 mm thick in 1:6 cement mortar
- Plaster: 15 mm thick cement plaster (1:4) on inside & outside walls

1.6 Pipes and Strainers:

- PVC Pipes: 20 cm diameter, CM Class, minimum 10 mm wall thickness with sockets and specials
- MS/ERW Pipes: 15 cm diameter, minimum 5.40 mm wall thickness, painted with red lead paint
- Slot Size Strainers: 1.5 mm × 57 mm, 72 slots per line

1.7 Accessories:

- Collection tanks, filtration channels, CI/steel rungs, MS grills, bail plugs, and pumps as specified

1.8 Puddle Clay:

- Selected clay conforming to CPWD specifications, free from impurities, for annular gap filling

1.9 Other Materials:

- Paints for marking capacity, scheme name, etc.: Shall conform **M44 page no-21**

All materials shall be **approved by the Engineer-in-Charge** with manufacturer's test certificates where applicable.

2. WORKMANSHIP

2.1 Boring & Excavation:

- Bore wells with 450 mm diameter using approved systems (Auger, Derrick, or equivalent).
- Excavation to required depth (100 rmt or as specified) through all soil strata including rock.
- Provide temporary **shoring or strutting** to prevent collapse in loose soil.

2.2 Collection Tank Construction (25,000 L, 3 m dia, 3 m liquid depth):

- Lay **100 mm thick PCC (1:4:8)** at foundation bottom.
- Construct brick masonry walls as per dimensions and mortar specified.
- Place **over-burnt brickbats (600 mm)** at bottom of well.
- Install **CI rungs @ 600 mm c/c**.
- Provide **PVC sleeves** for connection to filtration tank.
- Apply **15 mm thick cement plaster (1:4)** inside and outside.
- RCC Slab: 125 mm thick with **2 nos manhole covers with frames**.

2.3 Filtration Channel Construction (20,000 L, 750 mm wide, 2 m deep):

- Excavate, lay 100 mm thick PCC base.
- Construct 350 mm thick brick masonry walls in 1:6 cement mortar.
- Provide **gravel filling**: 300 mm of 20–40 mm size and 300 mm of 10–20 mm size.
- Fabricate and fix **MS grills** on top.

2.4 Pipe Installation:

- MS Pipe: 15 cm diameter, socketed, cut, threaded, red lead painted.
- PVC Pipe: 20 cm diameter CM class, socketed and joined.
- Slot strainer pipes: Installed to required depth as per engineer's direction.
- Bail plugs: PVC 20 cm × 3 m lowered to borehole.

2.5 Gravel and Clay Backfilling:

- Wash and shroud gravel to fill annular space between casing pipe and borehole.

- Fill remaining annular space with **puddle clay** for proper sealing.

2.6 Pumps, Tanks, and Equipment:

- Install pumps, water tanks, and associated plumbing as per drawings.
- Ensure proper alignment and functionality.

2.7 Testing:

- Conduct percolation tests, water flow tests, and hydraulic testing.
- Ensure proper functioning of strainers, casing withdrawal, and water collection.

2.8 Site Restoration:

- Remove all tools, debris, and surplus material.
- Backfill trenches with proper compaction.
- Leave the site clean and safe.

3. MODE OF MEASUREMENT & PAYMENT

Unit of Measurement:

1. **Percolation Well / Borehole:** Per bore (No.)

**Deputy Executive Engineer
Shahibaug (R&B) Sub Division
Ahmedabad**

**Executive Engineer
Ahmedabad City (R&B) Division
Ahmedabad**